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more customers from a bountiful
California agriculture region**

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A GAME CHANGER

**With added services and an inclusive
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enjoys steady growth** PAGE 34



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- David Steinkraus

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▶ **2013 Peterbilt 388**

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Contact Jim with your comments, questions and opinions at editor@pumper.com.

Don't Be Afraid to Counsel Customers on Wipes and Wiping

Let's keep working on a tipsheet for septic system users. Part of our job is saving customers from expense and emergency calls. **By Jim Kneiszel, Editor**

I knew a recent column I wrote about the best toilet paper choice for septic tanks would hit close to home with pumpers — and potentially maybe even rub a few of you the wrong way. *Pun intended.* After all, the issue is particularly personal when you're on the working end of a suction hose all day, wrestling through jampacked septic tanks. Here are a few responses to the column, as promised:

Al Kenney of Waste Connections in Brookings, Oregon, wrote:

I read your article on paper comparisons. I have great respect for Sara (Heger, Ph.D., engineer, researcher and instructor of the Onsite Sewage Treatment Program at the Water Resources Center at the University of Minnesota), as well as the (National Association of Wastewater Technicians) team. (Heger and Kim Seipp, NAWT education coordinator, were interviewed.) We run a Septic & Drain Cleaning Roto-Rooter franchise. The one thing we have found with toilet paper is that the (brands) with lanolin in them are very problematic. We tell our customers all the time to steer clear of those. There are two simple tests I suggest to people. 1) Rub the paper between your thumb and forefinger. If it feels slick, it probably has lanolin in it. And 2) Wad it into a ball and toss it in your toilet bowl. If it doesn't start to open up like a blooming flower, try another brand. I don't think it is really crucial whether it is single- or two-ply. It just needs to be dry paper, and used responsibly.

Richard Snyder of Snyder's Environmental Services, Columbus, Indiana, wrote:

Thank you for the latest article on toilet paper. After 30 years in the pumping business, I have not really done my own survey but we see a lot more paper blockages in the tanks. (These days, people) purchase 72-pack super rolls, no wonder there is excess usage. When I was a kid, I remember four-pack toilet paper packages!

My greater concern is the explosive use of "flushable" wipes. We are told that if we see wipes in a septic tank not to dispose that tank at our local treatment plant because it would clog equipment. We then must haul 60 miles and charge the customer three times the price. I do agree that higher pumping cost and education of the customer are the key to stopping this problem. I see this problem as only getting worse with our younger generations coming on.

I would like to know how other pumpers in the country are dealing with this. It might make another great article for your magazine.

WIPE OUT THE WIPES

I agree, Richard. Over the past several years, so-called flushable wipes have become a major issue for both the decentralized wastewater industry and municipal treatment plants. Misleading marketing of these products —

The best way to land customers for life is caring about the life of your customers. Explain that your goal is for them to enjoy the trouble-free use of their septic systems for many years to come.

and a lack of interest on the part of the woven products industry to make a degradable wipe — have cost our pumping customers and taxpayers billions of dollars in excessive and unnecessary costs.

Additionally, septic technicians working for every pumping company have spent countless hours emptying tanks filled with giant, stringy wads of this awful product. You horse the wipe balls out of the tank or suck them into the vacuum truck, and then what? The treatment plant doesn't want to take the mess. Can you blame them? Wipes have become just another reason for your usual disposal location to turn you away and make you drive farther to dump a load.

Your costs and frustrations are rising due to the growth in popularity of wipes, but your customers don't want to hear you request they stop using them. In fact, I've heard recently from a few pumpers whose customers would rather pay to pump more frequently or even pay more per pumpout than give up the convenience of using wipes.

MAKE A DIFFERENCE

There has to be ways to attack the wipes problem as well as overuse of toilet paper. Let's create a list of ideas to share with customers and the public to get these problems under control once and for all. Here are a few tips to start. Send me your ideas and I'll compile them in another column.

Throw the wipes out with the trash. After my first experience calling the plumber for a clog after wipes were used in our home for a medical condition, I wised up and started disposing of wipes in a separate trash receptacle. Removing the trash wasn't a great experience, but it beat having another \$200 drain cleaning bill. If you encounter a wipes problem in a customer's tank, suggest they also separate the wipes from the waste stream. They can collect the wipes in a plastic bag that can be tied or sealed whenever a wipe is added. Toss the wipes in the trash after collecting several dirty wipes. Another idea might be to use a Diaper Genie with a carbon filter to fight odors.

Ration the toilet paper. Parents have to start training kids to use less paper. At the risk of being too graphic in my descriptions, you don't need a wad the size of a softball for each swipe. Those perforations in the toilet



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paper are there for a reason. If you were supposed to use the whole roll each time you go to the bathroom, they wouldn't make it so easy to tear off small lengths. Maybe the manufacturers should print a warning every half-dozen squares to rip it and wipe. Of course, that wouldn't be in the best interest of Charmin or Quilted Northern; these companies want customers to burn through paper so they have to buy more.

Super-flush the toilet once a week. As for preventing toilet paper clogs, I've heard from a few pumpers who echo NAWT's Seipp when she advised homeowners pour a 5-gallon bucket of water down the toilet to keep paper moving through the pipes and into the septic tank. She also recommended scheduling pumping appointments more frequently if you can't get everyone in the household to improve wasteful toilet paper habits. More frequent maintenance may also help with use of wipes, but the only real solution is

keeping them out of the plumbing and the septic tank.

EDUCATION IS OUR JOB

You might think your job is driving a truck, or excavating a tank, or running the vacuum pump. All those tasks are the job of a pumper. But you and I are also responsible for educating the public on proper use and maintenance of septic systems. That includes sharing the cold hard facts of wipes and wiping.

The best way to land customers for life is caring about the life of your customers. Explain that your goal is for them to enjoy the trouble-free use of their septic systems for many years to come. You want them to avoid emergency calls and the expense of repairs and replacements. They will thank you for working in their best interests. ■



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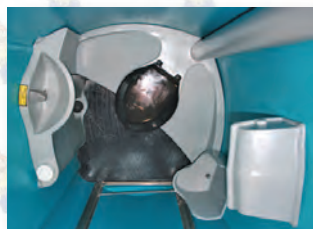


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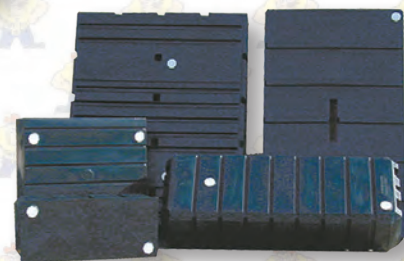
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TAX GUIDE

understanding the new W-4

One of the most recent implications of the Tax Cuts and Jobs Act is the complete overhaul of the W-4 form. With tax season upon us, it's a good idea for business owners to examine some of the ways in which this familiar document has changed. Business strategy expert Amanda Clark offers some important tips in this online exclusive article.

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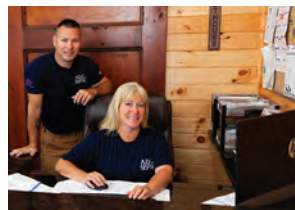


CORE STRATEGIES

team building and togetherness

Many business owners talk about their employees being part of the family. But they might not go as far as Chris Lanoue, owner of ADC Septic in Blackstone, Massachusetts. In the name of team building, he's offered his staff all expenses paid trips, free summer cookouts at his lakefront property, and access to a gym and backyard shooting range at company headquarters.

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“It is possible to run a septic services or portable sanitation business without field service management software, but I wouldn't want to.”

— *The Pros and Cons of Field Service Management Software*
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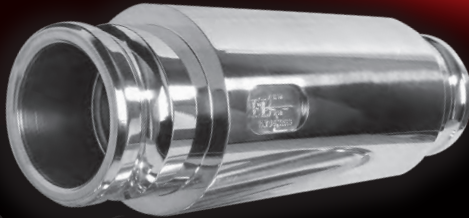


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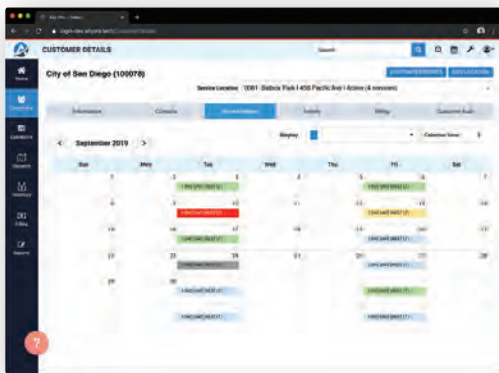


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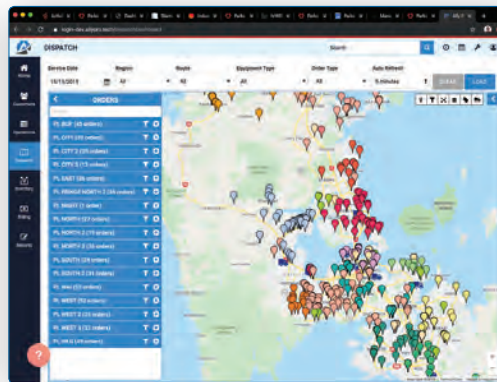


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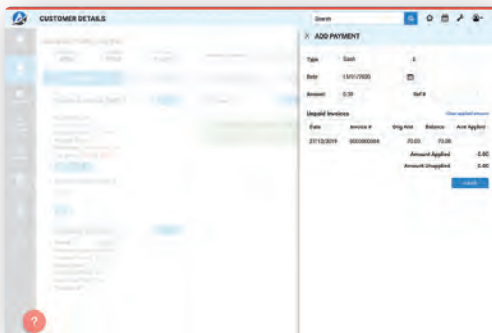
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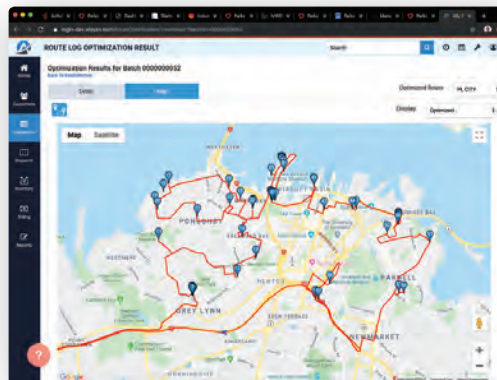
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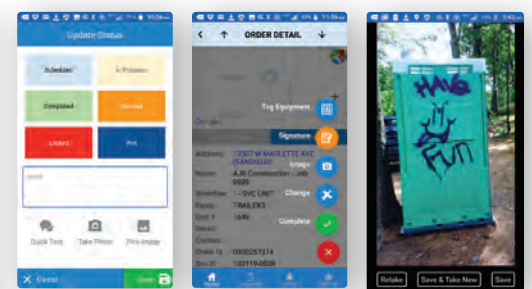
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RIPE FOR THE PICKING

Frank's Septic Services varies its offerings to pluck more customers from a bountiful central California agriculture region

By David Steinkraus

Foreman Scott Noble uses a Takeuchi excavator to install an Orenco Systems AdvanTex AX20 system with Geoflow driplines. (Photos by Lezlie Sterling)

When Frank Bonifacio started his wastewater business in Vacaville, California, 70 years ago, he was in the right spot for the company to thrive. Vacaville is about 54 miles northeast of San Francisco in the agriculture-heavy Central Valley that runs for 450 miles up the middle of the state. Today the four counties served by the company contain more than three-quarters of a million people. There are plenty of businesses and rural properties that need service, and Frank's Septic Services is still there to help.

It's a bigger company now, especially in the last few years as it has added people and equipment for pumping, installing and system maintenance. Work is divided about 50-50 between pumping and installing/regular maintenance, says Scott Noble, the company's operations manager.

GETTING CREATIVE

In their territory, there aren't too many aerobic treatment units in use, Noble says. "We do more engineered systems." That means, for example,

Orenco Systems AdvanTex AX20 units paired with a drip system. The Frank's Septic Services team has also started using Presby Environmental (Infiltrator Water Technologies) products. Gravity system installations are few, perhaps one to 10 annually, he says.

(continued)

Frank's Septic Services Inc. Vacaville, California

OWNER: Sean Bonifacio

FOUNDED: 1949

EMPLOYEES: 15

SERVICE AREA: Solano, Colusa, Yolo and Napa counties in central California

SERVICES: Installing, aerobic treatment unit service, inspections, pumping, grease trap service

AFFILIATIONS: National Association of Waste Transporters, California Onsite Wastewater Association

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Right: Technicians Noah O'Reilly, left, and Enrique Alvarez use a Toro Dingo TX1000 with a vibratory plow attachment to lay driplines.

Below: A.J. Bonifacio, Frederik Palomares, Alvarez, O'Reilly and Sean Bonifacio install driplines for a residential septic system.



Left: O'Reilly works with driplines in a trench.

The company's home county, Solano, has good soils in the northwest, Noble says. In the southeast and throughout much of the rest of the county, the soils are clay with limiting layers and high seasonal groundwater, says Sean Bonifacio, the company owner.

"We have to get really creative on what type of system to put in," Noble says.

One factor installers always check is the size of the drainfield specified by an engineer. Standard calculations may call for 1,000 square feet of drainfield, he says, but the Frank's Septic Services team insists on 2,000 square feet because they know from experience that a field sized according to accepted guidelines will quickly become overloaded in their soils.

Installation season starts around the end of March and continues into the fall, or whenever the rainy season begins.

"We've worked sometimes year-round or worked until Thanksgiving, and then we're down for three to four months," Noble says.

WINERY WORK

Vacaville is on the western edge of the Central Valley. To the west are the coastal hills and mountains and the valleys that form California's famous wine country. Napa County is about a 30-minute drive from Vacaville. For Frank's Septic Services, wine country means business because of all the wastewater generated by the vinting process.

Wineries typically have lagoons or some kind of wastewater storage. When they're down to two or three days of capacity, Frank's Septic Services gets a call, Noble says. One winery may produce two or three loads, and that will be a day's work for one of the big tank trailers that hold 5,000 or 6,000 gallons, Noble says.

Disposal is either at the East Bay Municipal Utility District in Oakland, about 48 miles southwest of Vacaville, or the Yolo County landfill, which is about 27 miles north. Yolo County just established a large dumping station at its landfill site, Noble says.

Heavier solids settle out in a large pit, and a series of canals take away the rest of the liquid and settle the lighter solids.

A worker monitors the site, and when it reaches capacity, the county halts dumping for a few days as workers clean out the solids. "Then you get the email saying they're back open for business," Noble says.

Frank's Septic Services technicians don't go far into wine country, Noble says, only 20 or 30 miles because there are plenty of other good providers farther inside Napa County.

When they're not hauling winery wastewater, the big tanker trailers are still useful for other commercial jobs. For example, the company has a contract with a Vacaville restaurant to pump its grease trap. That happens every quarter, and it requires a big tanker to remove most of the waste and then a visit from one of the smaller vacuum trucks to do the final cleaning and clean the lift station. Residential tanks average about 2,000 gallons.

Trucks are on the road every day of the week except for some Saturdays, Noble says.

(continued)



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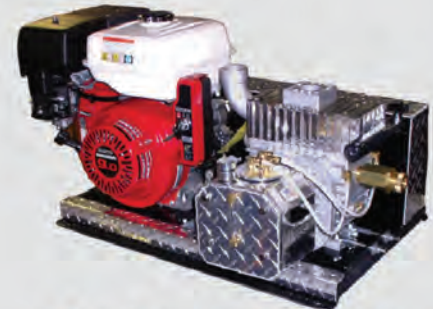
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Right: Owner Sean Bonifacio discusses the daily work schedule with Johanna Azevedo, the office manager at Frank's Septic Services.

Below: An old photo shows company founder Frank Bonifacio with a young Sean Bonifacio.



LOTS OF EQUIPMENT

To handle all this work, the Frank's Septic Services team depends on:

- 2014 Peterbilt with a 2,500-gallon aluminum tank and National Vacuum Equipment 607 Challenger pump
- 2010 Mack cabover with a 2,500-gallon aluminum tank and Jurop/Chandler pump
- Eight 5,000-6,000 tanker trailers pulled by 2010 to 2012 Mack tractors
- Two Takeuchi excavators, a TB260 and TB016
- Case CX36B excavator
- Two tracked Takeuchi skid-steers, a TL140 and TL10V2
- Toro Dingo TX 1000 used for the vibratory plow for installing driplines
- 2018 Ford F-550
- 2007 Ford F-350
- Ford F-350 for hauling equipment
- 2007 Chevy Silverado 2500 service truck

The fleet has undergone major changes because of California's engine-emissions rules. A few years ago, California began requiring truck owners to upgrade their fleets to newer and cleaner engines.

The process will end in 2023. Over this period, the state has a schedule of when vehicles from certain model years must meet new air rules. For example, from 2013 to 2021, heavy trucks (GVWR greater than 26,000 pounds) with engines built from 2000 to 2004 must have a filter to trap small particles of soot. After 2021, those trucks must have engines built in 2010 or later.

Fortunately, Noble says, the state's scheduling did not require the company to replace all of its trucks at once. They could pick up one or two and sell others. "It was a slow process, but we now meet all the rules," he says.

ADDING STAFF

Frank's Septic Services has expanded with the workload. When Noble joined the company in 2007, just after owner Sean Bonifacio took over from his father, Alvin, there was one vacuum truck driver. Now there are enough so a customer with an urgent need can be served right away. There are six to eight drivers for the big tank trucks. Two to three people used to handle the installations; now it's five to six, including Noble. One person used to handle the office work; now it's two full-time people with one part-time person dedicated to answering phones and making sure registrations and insurance are current for the fleet.

Keeping 70 years of onsite records

Locating a septic tank can hold up a job, unless you've taken the trouble to get ahead of the problem. At Frank's Septic Services in California, the team has been good about encouraging customers to install risers to make the job easier, says Scott Noble, the company's operations manager.

"We tell customers it's a lot cheaper and easier for all of us if they let us put in a riser," he says, "because there have been winters when we're trying to dig up their septic tanks in the mud."

Frank's Septic Services marked 70 years in business in 2019, and the installation records from all those years are still in the company's office. It's amazing to look at files from the '50s or '60s, Noble says. It was before modern regulations and inspections, he

says, and someone from the company would go to the county and say, 'We're putting this size tank on this property.' And that's all there was to it.

Those old records can come in handy when the Frank's Septic Services team is trying to find an old tank. They can make a better guess at where to start digging.

"What's funny is sometimes Solano County is calling us to say, 'We don't have a record,'" Noble says. When that happens, the Frank's Septic Services team tries to help them out by looking in its own files.

“ We tell customers it's a lot cheaper and easier for all of us if they let us put in a riser because there have been winters when we're trying to dig up their septic tanks in the mud.”

SCOTT NOBLE



All the company's business is based on reputation and word-of-mouth, Noble says. For a long time, Bonifacio paid for ads in the local phone book, and when social media started, he became very active with that. "Then he realized that our phones were still ringing, and he was paying a lot of money for advertising," Noble says. Bonifacio scrapped the advertising, and the phones kept ringing.

Busy as they are, it's reasonable to ask whether Frank's Septic Services could use a few more people. "We're trying," Noble says. But the labor force is not what it was 20 years ago, or even 10, he says. People are no longer committed to jobs.

"They want the paycheck, but they don't want to work to earn it," Noble says. "This is construction; it's about production, and we need people who understand those commitments."

"Our economy is so good right now that it's hard to find good help," he continues. And there are people who apply for jobs but believe they should earn more despite a lack of experience. "There's more to what we do, and we expect a lot, and they get frustrated and leave."

Bonifacio is trying to find someone with electrical experience who can figure out problems, Noble says. Noble does scheduling, ordering materials, and county inspections, and he fills in on installation crews. When all employees are back at work, Noble consults the spreadsheet of systems that Frank's Septic Services maintains. Some need to be checked quarterly, others only once every six or seven months. If he doesn't need to fill in on trucks, he catches up on the service work and schedules more appointments with customers.

Owner Sean Bonifacio with his son, A.J. Bonifacio, 13.

“Our economy is so good right now that it's hard to find good help. There's more to what we do, and we expect a lot, and they get frustrated and leave.”

SCOTT NOBLE

The company is just at the point where it's offering health benefits including medical, dental and vision coverage, Noble says. That should encourage people to stay on, he says.

ON THE GROW

From 2010 to 2018, the population of the U.S. grew by 6%. Frank's Septic Services' home county of Solano grew by 8.1%, and the next county north, Yolo, grew by 9.7%. That's more people and more potential customers, and the pace of work at Frank's Septic Services is a testament to the growth. Bonifacio says he doesn't have any particular plans for growth. What has happened to the company over the past decades happened naturally, he says; it all came about simply from meeting customers' needs.

With the right people in place, the seed of a company that Frank Bonifacio planted 70 years ago will continue to grow and branch out toward the big California sky. ■

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Effort to Create a Michigan Sanitary Code Is Moving Slowly

By David Steinkraus

It's been more than a year since the attempt to create a statewide sanitary code failed in the Michigan Legislature, but the idea is not dead. It can happen under the right circumstances, says one observer of the state's wastewater struggles. Michigan is the only state without a statewide code.

Late last year, a symposium in Traverse City — in the northwestern part of the state's Lower Peninsula — assembled people to talk about the issue. Also at that time, a member of the Michigan Environmental Council, a coalition of groups interested in public policy, called for better rules for onsite systems and system inspections. In addition, commissioners for Oakland County, near Detroit, endorsed a resolution urging the Legislature to pass a statewide code.

People in Michigan can have a statewide code, and Ohio has already shown the way, says Dendra Best, executive director of the nonprofit Waste-Water Education based in Traverse City. There were several attempts in its Legislature before Ohio achieved success, she says.

The Michigan bill that failed earlier would have required the state Department of Environmental Quality to develop rules for the siting and design of onsite systems, for effluent, for inspections and maintenance, and for the qualification of people managing and installing onsite systems. Every system would have had to be assessed at least every 10 years, but advanced treatment units would have had to be inspected at least every five years.

Opponents of the bill were loud and numerous. They objected to some provisions in the legislation, but opposition was focused on how the bill was created. That happened behind closed doors, say opponents, including some local health departments who say their concerns were ignored. The bill stalled in committee and died when the legislative session ended.

"How Ohio actually got to the point of passing (its law) was that everybody had something to complain about, but everybody felt their opinions had been taken into consideration. And everything was fair and affordable," Best says.

Contrast that with the Michigan bill. There was no provision for low-interest loans or grants to help people afford the cost of upgrading or repairing onsite systems, she says. Upgrades must be affordable if we are to protect human health, Best says, and the law should not penalize people just because they can't come up with the money for a better system. "You can't have a piece of legislation that's all stick and no carrot."

Ohio took several years to slowly work through what should be in its code — sections about soils, local geology, installation, and training for installers and designers, she says. Ohio's code, the first major revision since the 1970s, took effect in 2015.

Best says she applied for a grant that would pay for WasteWater Education to facilitate the process of writing a statewide code. Facilitation would happen through an online conferencing platform, which means people wouldn't have to drive to the state capitol in Lansing to be part of the process. That's especially important for people who live in the Upper Peninsula, far from Lansing, she says.

At the Traverse City symposium, two lines of thought remained. One says a statewide code is necessary to make sure the environment and public health are protected, and the other says no statewide code would allow enough adjustments to fit local soils and other conditions.

"But there is a way out of it if people will sit back, take a deep breath and do it right," Best says.

• • •

Two counties each blocked the other's attempt to change its time-of-sale onsite inspection program. Commissioners in Manistee County denied permission for nearby Kalkaska County to end its inspection program. Manistee's approval was required under the rules of the district health department, which is composed of several area counties.

Kalkaska officials were unhappy. The Kalkaska County Board had approved Manistee County's proposal to end some exemptions and change other rules in its own inspection program, reports the *Record-Eagle* of Traverse City. Kalkaska County commissioners were so unhappy that they held a second vote on the Manistee County changes, and this time denied them.

Questions arose about the legality of the second vote, but an attorney who researched the issue says it was legal.

• • •

The time-of-sale onsite inspection program in Isabella County may be paying off. During 2018, inspectors looked at 475 properties and found 66 in need of some kind of repair or overhaul. Of the 66, 19 were discharging untreated wastewater into streams, tiles or onto the ground, writes *The Morning Sun* based in Alma.

"I'm surprised by the number of illegal systems people are trying to put in," Central Michigan District Health Department Environmental Health Supervisor Scott Jones told a committee assigned to track the inspection program. He says the number of failures, and the causes of failure, were not surprising.

He told the committee that testing on the North Branch Chippewa River found lower *E. coli* numbers than in prior years. While it is too early to rule out other causes, Jones says, the reduced bacteria count may indicate that the inspection program is having an effect.

Rhode Island

Portsmouth residents will have another chance at financing to close cesspools or upgrade onsite systems. Last December, the Rhode Island Infrastructure Bank announced a third round of funding for zero-interest loans for such work.

Residents may borrow up to \$25,000 for their projects, and money may be used to cover both engineering and construction costs, reports the news website Patch. During the past three years, 850 people in the state have taken advantage of the program.

Florida

As part of its work to combat local water pollution, Alachua County recently turned its attention to nitrogen-reducing onsite systems. County commissioners said they wanted more information and asked staff of the county's Environmental Protection Department to develop cost estimates for installing nitrogen-reducing systems in new residential developments, reports *The Gainesville Sun*.

"I just don't know if this is going to have the impact that we're wanting," says Commissioner Ken Cornell. The real cause of pollution seems not to be onsite systems but agriculture, he says. County staff agree.

Montana

A meeting to talk about the problem of septic leachate in the Flathead Valley resulted in the formation of a committee to try to do something about it.

The committee will consist of biologists, tribal representatives and others, reports the *Daily Inter Lake* based in Kalispell. Through research and outreach, the committee will try to make the issue of septic leachate an important one for homeowners and governments.

"No one really knows how to deal with non-point source because it's not coming out of a pipe directly in front of your eyes," says Tom Bansak, assistant director for the Flathead Lake Biological Station.

Another task of the committee is to explore regulations such as the onsite inspection programs used in other parts of the country.

Missouri

Grants are available to replace failing septic systems in the watersheds of Crane Creek and Lower James River. The size of each grant will depend on household income. Grants will cover 50% to 90% of costs, reports the *Christian County Headliner News* of Ozark, Missouri.

Texas

People living in the Attoyac Bayou watershed may be eligible for grants that pay for new septic systems. The watershed is polluted with *E. coli* coming in part from failing wastewater systems. Homes within 2,000 feet of an affected body of water will have priority. Only households with incomes at or less than 150% of the median household income will be eligible for grants, according to the Angelina & Neches River Authority.

Massachusetts

A U.S. Environmental Protection Agency decision that it cannot use the Clean Water Act to regulate pollution flowing through groundwater

needs to be respected, a federal judge said recently as he dismissed a lawsuit seeking to regulate such pollution in the state.

Last fall, the U.S. Supreme Court heard oral arguments in a similar case from Hawaii where a group of organizations said the act should be used to stop pollution flowing through groundwater from deep injection wells operated by Maui County's wastewater treatment plant.

The EPA had said that it cannot regulate pollution that starts at a point source and moves through groundwater. This is a change from its previous policy, writes *Bloomberg Environment*.

The Massachusetts case that Judge William G. Young ruled on involves a wastewater treatment system at the Wychmere Beach Club on Cape Cod. The state Department of Environmental Protection found that wastewater seeping through groundwater from the system was partly responsible for excess nitrogen in Wychmere Harbor, and the nonprofit Conservation Law Foundation filed two lawsuits seeking to curb the pollution. One was based on the Clean Water Act, and the other on the Resource Conservation and Recovery Act.

After Young's ruling, the Clean Water Act lawsuit is dead, but the other will continue. ■

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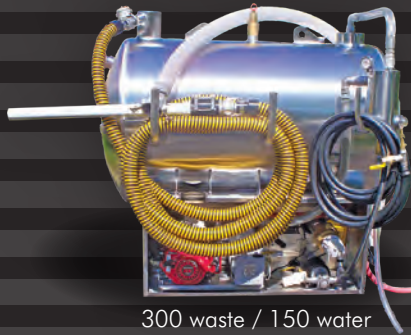
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Are Service Contracts the Way of the Future for Wastewater Services?

Signing up customers for long-term care can ensure better system performance for the customer and guaranteed workload for the contractor **By Joan Koehne**

The ongoing inspection and maintenance of septic systems, grease traps, drains and plumbing fixtures can provide contractors with a worthwhile supplemental income. Preventive maintenance contracts help to build strong customer relationships and provide ongoing work for crews during the slow times of the year. Additionally, regularly scheduled inspections reveal problems that need correcting — leading to more work for you and fewer emergency calls from unhappy customers.

If you're ready to add maintenance contracts to your list of offerings, you should first become familiar with the legalities of these arrangements.

"Anytime you have a contract, it's always an exchange of promises," says Devin Shanley, Wisconsin attorney. "If you draft this as a standard contract, you want to be aware of what you're promising to do for the client and what they're going to be promising for you."

Bob Johnson, owner of Effluent Technologies in Tiverton, Rhode Island, agrees.

"Be very specific about what's going to be done," Johnson says. Effluent Technologies uses maintenance contracts for different systems in southeastern New England, including conventional septic systems, pump systems and advanced treatment facilities.

"Some contracts are a regulatory requirement, and some are for property owner peace of mind," Johnson says. His company sustains maintenance agreements with residential, commercial and municipal clients.

CLEAR TERMS

Always use clear and understandable terms. "On the contract, make sure it's laid out so everybody knows what their responsibilities are so you don't get, 'I thought you were doing this,'" he says. For example, the property owner is responsible for contacting the contractor if any problems arise. "It could be alarms. It could be odors. It could be backups."

Likewise, the contractor is responsible for providing the services outlined in the contract within the specified time frame. Effluent Technologies' contracts include an inspection, routine services and full cleaning of the system, with the exception of pumping.

"In the contract, we put that septic pumping is done by others. We have a list of vendors we work with, and it's up to the property owner to make a decision about who they want to work with," Johnson says.

To reduce the upfront expense when drafting its initial maintenance contracts, Effluent Technologies started with a manufacturer's template.

Shanley says a template or something similar can be a good starting

point, but "Be aware of what you're trying to protect yourself from and how things can go wrong."

SEEK LEGAL ADVICE

"The best option is to contact a lawyer — if possible, someone who's had experience drafting service agreements like this or someone in the construction law field. They can anticipate the issues that you might not even see and have provisions and contingencies already lined up," he says.

The template made it easy for Effluent Technologies to create cookie-cutter contracts for similar systems. An attorney reviewed the legal language before the agreements were presented to clients.

“Be very specific about what's going to be done. ... Some contracts are a regulatory requirement, and some are for property owner peace of mind.”

Bob Johnson

"On all of our contracts, the general knowledge is the same, other than what we're going to do or not do," Johnson says. Spell out very specifically what will be done, even if it seems obvious. One system may have two filters that will be cleaned, for example, while others have only one.

Shanley says every contract should answer important questions: How and when are you going to get paid? How will you notify the client when services are completed? How does the client communicate with you?

Additionally, every contract should include a certain amount of boilerplate language — the legal terminology that often largely goes unnoticed. Some of this terminology deals with important issues if a conflict arises. To resolve a conflict, do you go to a court of law or some sort of arbitration? What laws are going to be used? Where will the disagreement be resolved?

"It's probably going to be the state you're residing in, but maybe if you're working in two or three different states, that might be an issue," Shanley says.

A contractor might want to specify a local jurisdiction to avoid traveling far from home to reach a settlement.

GO FOR RENEWALS?

The length of time a contract covers is something else to consider. Shanley recommends checking with the state's consumer protection agency or secretary of state for any applicable government regulations. Secondly, he

recommends a contract length that makes the best business sense. It's time to draft a fresh contract when terms or prices change.

"If you're going to have the contract automatically renew, you need to have the provision built in," he says.

Pipe Masters, a plumbing and piping contractor in Honolulu, prefers to negotiate three- to five-year agreements.

"Not everybody likes to get into a multiyear contract at first, but we educate our customers on the value in doing so," says Jason Koran, owner of Pipe Masters. The company's contracts describe the routine maintenance to be performed and offer clients a discount on subsequent cleaning and repair.

Pipe Masters uses individualized maintenance contracts for commercial and municipal customers based on the system covered. The company has select contracts for sewer drains, storm drains, backflow preventers, grease drains at shopping centers and the like. For example, the company's maintenance contract for drains includes drain cleaning, inspection and leak detection with a thermal camera.

By having a team of attorneys on retainer, Pipe Masters can access legal advice when questions pop up. Generally, Koran does his own contract negotiations and review.

"It helps that I know what I'm looking at nowadays," he says. "I've been doing it long enough that I can easily spot the things I won't agree to, and I just line out anything like that. If a contract is created by the customer and presented to me, it's never something I feel forced to sign. It's just a negotiation. They put on paper what they're preferring. I tell them what I'm not willing to agree to."

In his experience, municipal and commercial customers prefer to draw up their own contracts.

"Not much responsibility is on us to create a final version," Koran says.

OFFERING A DISCOUNT

However, the company takes a different approach with residential customers who sign membership agreements for plumbing system maintenance. Beginning in July 2019, Pipe Masters started selling memberships to residential customers, offering an annual plumbing inspection and 10% discount on services within a one-year time frame.

"The initial walk-through and aboveground inspection are done as a courtesy. If we think something looks bad enough above ground that we need to understand what's going on below-ground, those are chargeable services," Koran explains.

He says it took several years for Pipe Masters

to develop a smooth transition into residential memberships. "Going hand in hand with more memberships, you have a lot of follow-up before a job is scheduled and quality control afterward," he says.

Pipe Masters put three things in place before marketing residential memberships:

1. Personnel: The company doubled its office staff from two to four employees.

2. Sales training: Plumbers learned how to present memberships to customers on digital tablets. Using images, they show customers the cost of services and explain how memberships

can save them money.

3. Software: Pipe Masters invested in a program created for HVAC and plumbing companies.

"Each is a big-ticket item, and there are no shortcuts," Koran says. "If you don't have your systems in place, don't rush to have contracts."

Additionally, contractors who are ready to introduce contracts accept a new scope of legal obligations. These obligations need to be clearly outlined for both the contractor and the client. Both parties need to agree on the terms of service, payment, how to communicate and how to resolve conflict — two parties, two promises. ■



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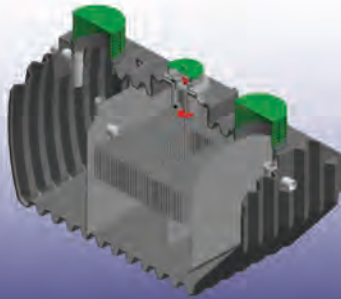
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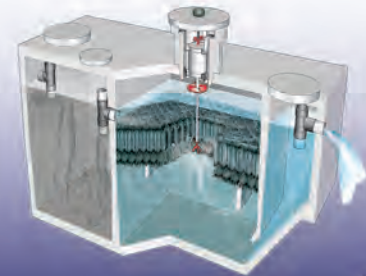
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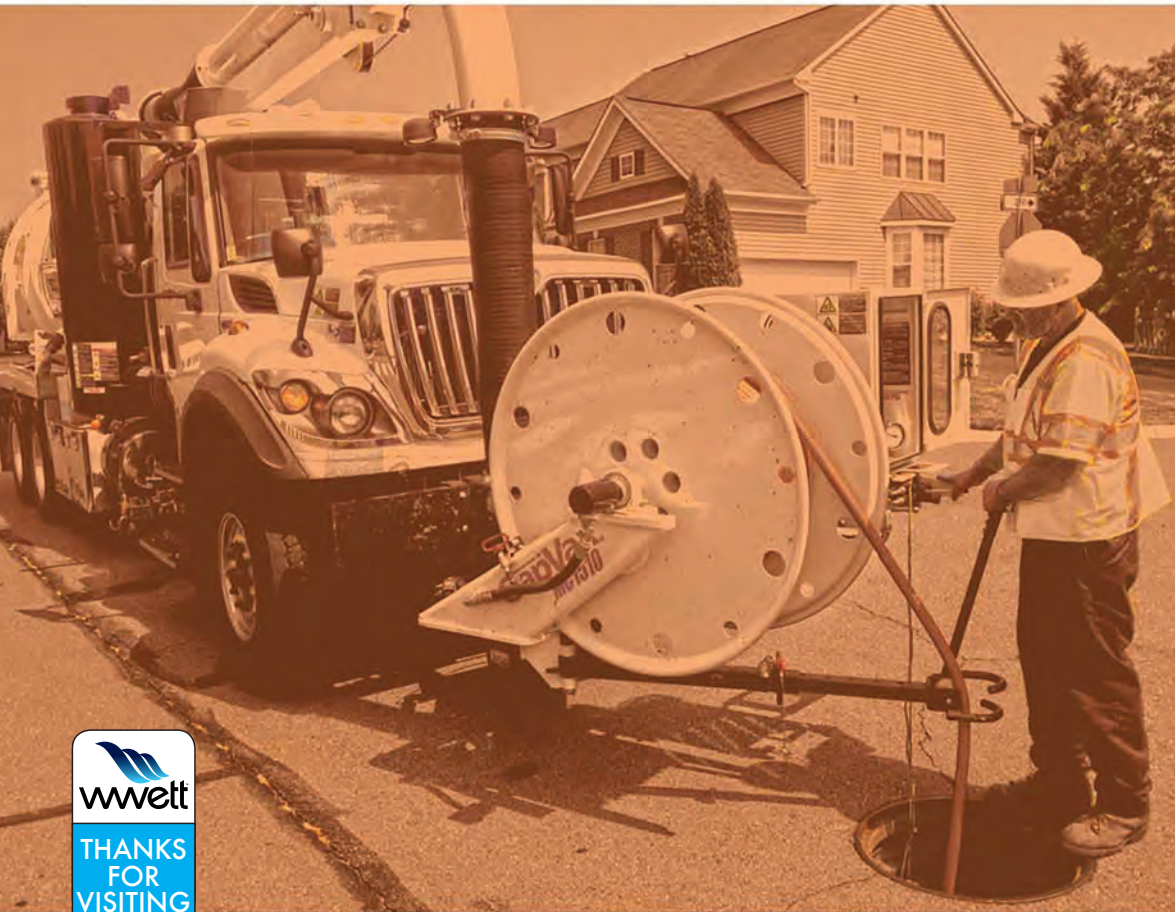
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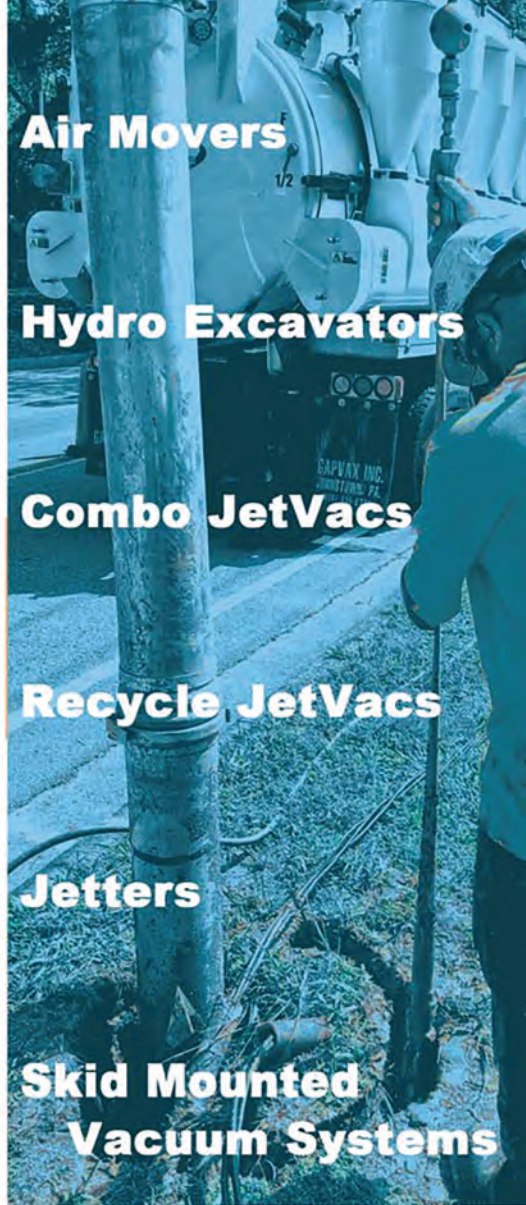
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KING'S
SERVICES—

Steve Moon, owner of King's Services, on the job in Headingley, Manitoba. He is shown with a Peterbilt vacuum truck built out by SchellVac Equipment and carrying a tank from SchellVac and Fruitland pump. (Photos by Joel Boily)

A GAME CHANGER

Added services to meet customer demands and a more inclusive corporate identity help Canada's King's Services enjoy steady growth **By Betty Dageforde**

In 2004 Steve Moon was working at a bank as a certified public accountant helping companies buy and sell businesses when one of those businesses caught his eye. As a result, his career headed off in a very different direction. He knew nothing about portable sanitation or septic systems but could see that King's Septic and Portable Toilet Service had good numbers and a lot of promise. He left banking and bought the business.

Between the operational expertise of its then eight employees and Moon's business savvy, the transition went fairly smoothly. But to help him really get up to speed, Moon embarked upon an intense period of education on everything from industry basics to employee management — and he hasn't stopped since. "I really have a 'never stop learning' attitude," he says. "I really focus on that." And that applies not only to himself, but to his employees as well.

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King's Services Headingley, Manitoba

OWNER: Steve Moon

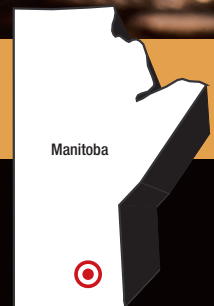
FOUNDED: 1985

EMPLOYEES: 35

SERVICE AREA: 30-mile radius

SERVICES: Septic service, portable sanitation, onsite installation, repairs and inspections; plumbing and drain cleaning; fencing

WEBSITE: www.kingsservices.com

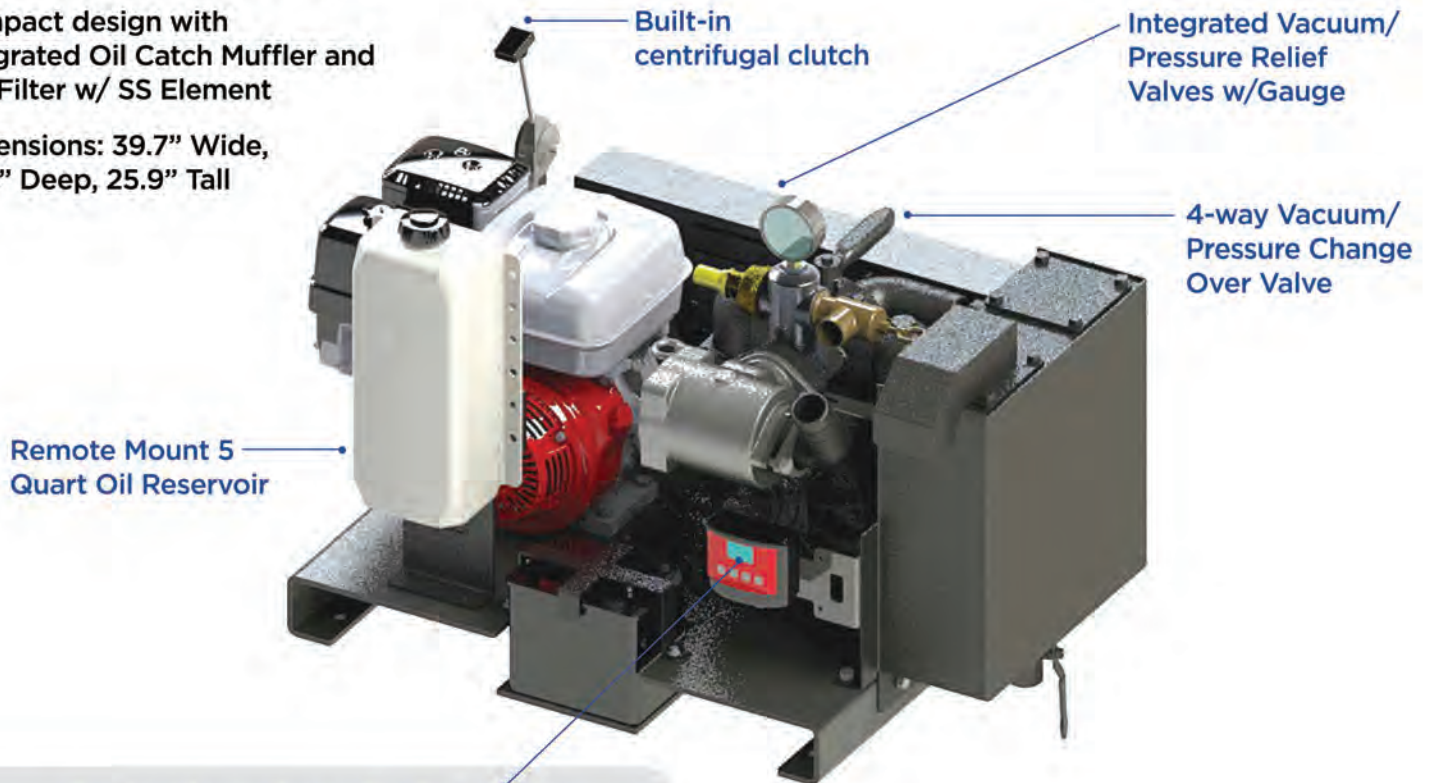


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Moon believes continuing education — along with providing good customer service and taking care of employees — has been a big key to his success in growing the company to its current 35 employees. He's also added two service lines — plumbing/drain cleaning and fencing. The company, now called King's Services, operates out of a 13,000-square-foot facility in Headingley, Manitoba, and serves a 30-mile radius around the greater Winnipeg market.

GROWTH SPURT

Although Moon says he wasn't necessarily looking to buy a business, he isn't entirely surprised he did. "My dad owned his own business, a tool-and-die and welding shop, so I've always had that entrepreneurial blood in me," he says. At one time, he entertained the idea of taking over his father's business but knew it just didn't suit his interests or skills.

King's was a well-established company, founded in 1985 by Bruce King. Moon saw it had a great customer base, consistent cash flow, growth potential and a lot of small players in the sector, indicating acquisition potential, which suited his background. In 2008 he bought a local company, adding to his inventory and customer base. The purchase came along with the former owner, Gerry Girardin, who worked as his director of operations for 10 years before retiring.

In 2017 Moon bought the local division of a national fence business, Modu-Loc, enabling him to offer temporary fencing to his portable restroom customers. Five people work in that division along with Terry Rempel, manager.

And in 2018 he added a plumbing and drain cleaning division after receiving a number of customer requests — "If you listen to your customers, they'll tell you what they want." Rempel also manages this division and oversees two employees. Equipment includes Ford and Chevy service vans, a RIDGID camera and three RIDGID drain cleaners in sizes to handle anything from sinks to sewer mains. To help build up that business, he began offering home inspections.

Technician Alex Sizonenka returns the hose to a service truck after a pumping job. The truck is a Peterbilt carrying a SchellVac Equipment tank and Fruitland pump.

"A home is the biggest investment people have, and they don't do a lot of maintenance on it," Moon says. "The No. 1 cause of damage in a house is water. So by having that inspection of the hot-water tank, lines, drains, toilets, we're trying to be a little more preventive on this stuff rather than 'Oh my God, I've got a problem.'"

WINTER JACKETS

Manager Mike Campbell and 11 technicians work in the portable sanitation division, which accounts for about half the company's revenue. About 80% of its work is for construction. Events include the Father's Day Manitoba Marathon, numerous Canada Day activities involving all units and the Winnipeg ManyFest community festival.

(continued)

“ All my managers have recruiting cards. If somebody treats them really well at a restaurant or wherever, the manager can give them a recruiting card and say, 'Call me.' ”

STEVE MOON



The King's Services team providing portable sanitation for a special event in Winnipeg, Manitoba, include (from left) Alex Bain, Fabien Peters, Mike Campbell, Steve Moon, Mark Mulla, David Mariner, Mussie Tewolde, Don Brennan and Elmer Oduca.



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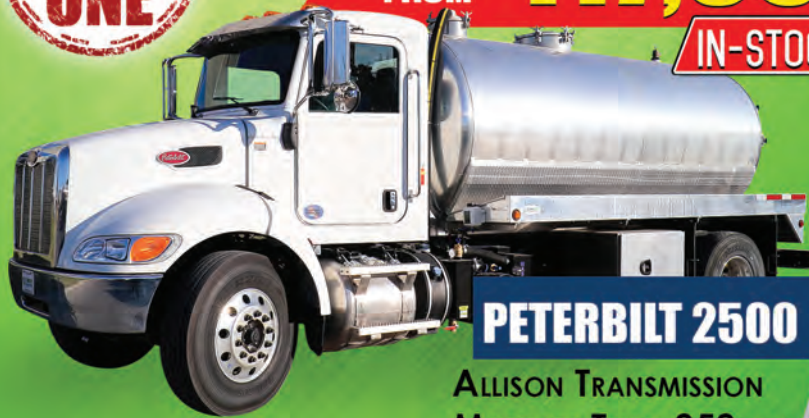
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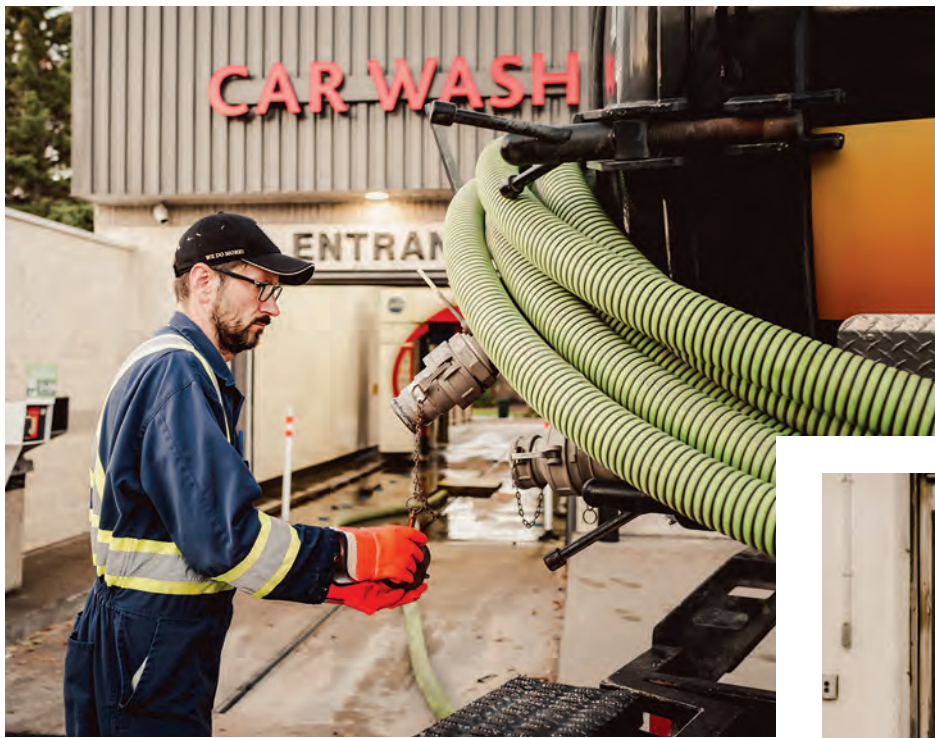
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Left: Technician Alex Sizonenka prepares to attach a suction hose to the back of his service truck.

Below: Sizonenka, left, and Steve Moon pump a car wash pit in Winnipeg, Manitoba.



Don't let your name hold you back

The company Steve Moon bought in 2004 was called King's Septic and Portable Toilet Service, which at the time described exactly what the company did. But as he added other service lines, the name no longer fit. In the fall of 2018, he decided to rebrand the company with a new name, new logo and new look for the trucks.

"Our name now is King's Services," Moon says. "I did that because I didn't want to pigeonhole us to just septic and portable toilets. If people think all you do is septic, they won't look at you for other things. We're trying to create a world-class brand, and we couldn't do it with the name we had. We feel this will help the company grow."

Instead of hiring a marketing person to help him design a logo, he put it out to the world through a website called LogoTournament.

"You basically create a tournament online where you have all these designers from around the world creating a logo for you and you pay the winner," Moon says. About 100 designs were submitted, and it cost Moon about \$500. He did the same thing with their truck wrap design using the online company 99designs. "You send them the type of truck you want wrapped, then you get designs. It takes a couple weeks."

Moon admits rebranding was a big effort, a bit painful and not cheap — but well worth it.

“ Our name now is King's Services. ... I didn't want to pigeonhole us to just septic and portable toilets. ... We're trying to create a world-class brand, and we couldn't do it with the name we had. We feel this will help the company grow. ”

STEVE MOON

Inventory includes 1,100 standard units, 35 handicapped-accessible units, 40 high-rise units and 50 hand-wash stations — all from Satellite | PolyPortables. Moon likes gray for his units. "It's not the flashiest color, but I think it shows dirt the least and seems a little more upscale," he explains.

About 10 years ago, a marketing student who Moon hired for the summer conducted customer surveys, and one thing that kept coming up was the desire for heated units in the winter. So Moon developed a couple solutions. At the low end, they offer a windproof and waterproof parka with an R-4 insulation value. "It's basically a jacket that goes over a regular portable toilet, along with a space heater inside the unit," Moon says. The company has them built based on a patent Moon picked up with one of his acquisitions. At the higher end, he offers single and double trailers with running water and electric heat that are designed by the company and built in-house. They have about 50 of those along with one higher-end trailer from Rich Specialty Trailers.

The company has five restroom transport options — 7-, 9- and 14-unit trailers from Saturn Industries and a 12-unit trailer from McKee Technologies. Its 2016 Ford F-550 built out by Satellite Vacuum Trucks holds eight units and has a 400-gallon tank and Masport pump. They also have six Ford F-550s (2012-17) vacuum trucks, two built out by SchellVac Equipment with 650-gallon waste and 300-gallon freshwater carbon steel tanks and Fruitland 250 pumps, and four from Satellite Vacuum Trucks with Masport HXL4V pumps, one with a 775-gallon waste and 400-gallon freshwater aluminum

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David Mariner cleans the exterior of a bank of Satellite I PolyPortables restrooms at a special event in Winnipeg, Manitoba.

tank, one with a 450-gallon waste and 150-gallon freshwater steel tank, and two with 650-gallon waste and 300-gallon freshwater steel tanks. Units are pressure-washed with 1,800 psi electric Cat Pumps pressure washers. The company uses Safe-T-Fresh deodorizer. Drivers rely on Soft-Pak routing software along with Samsung tablets to access routes, directions and customer notes.

MORE SHIFTS, MORE SERVICES

Kevin Karbonik manages seven people in the septic service division. The company's six vacuum trucks (five Peterbilt, one Freightliner) have 3,600-gallon steel tanks built by SchellVac Equipment, Presvac Systems and Glendale Industries. All have Fruitland RCF1200 pumps. The 2010 unit will soon be replaced by a 2020; the others are 2015-20 models. For grease traps, a Dyna-Vac Equipment portable pumping system is rolled into a restaurant when vacuum trucks can't reach. Other equipment includes RIDGID cameras and a couple of onboard Pratisoli jettors.

The company has recently added a 2 p.m. to 10 p.m. night shift and an 8 a.m. to 4 p.m. weekend shift. Moon believes it gives them a competitive advantage, while also alleviating employee burnout from excessive overtime.

"It gives our customers more options," he says. "They don't have to take time off work. We are gaining customers because of this. And we didn't have to buy another truck; we just hired a guy."

Last summer, the company added onsite system installation services. They rent excavation equipment as needed. They also started performing real estate inspections — not currently required in the province, but lenders often request it.

OFFICE MATTERS

Working in the office is Farley Boutet, director of sales; Sharla Cerezo, office manager, who oversees a staff of five; and Moon's wife, Kelly, who is part-time director of safety and manager of the certificate of recognition (COR) program.

"It's a national certificate for safety," Moon explains. "The program is not quite mandatory but highly recommended for construction sites. It's the highest Canadian standard for construction safety." The program involves holding monthly meetings, putting safety processes in place, doing an annual internal audit and being audited by COR every three years.

The company experiences low turnover, but recruitment is an ongoing process by everyone, even when they're not actively looking.

"All my managers have recruiting cards," Moon says. "If somebody treats them really well at a restaurant or wherever, the manager can give them a recruiting card and say, 'Call me.' The same with my employees. They'll come up to me and say, 'You should talk to this guy. He's a great guy.'" Moon says they probably have the best staff they've ever had right now.

Corporate culture is very important to Moon. "It's very underrated but we've really tried to put a lot of time, effort and money into our culture here. We listen to our guys, we treat them well, and we live by core values." As a result, Moon says the company is seen as a desirable place to work. Most of the time, he says, money is not the driving factor in hiring and retaining good workers. "The studies are there. It's mostly recognition, feeling valued and feeling satisfied that their job matters," he says.

Moon says he spends a lot of money on training for employees, sending them to courses, trade shows and education days. He also provides in-house courses on everything from sales training to customer service to field techniques. Each division holds weekly meetings, and monthly there's an early morning all-company meeting. Managers are tasked with continually coaching their staff, a key metric they're judged on. Moon does the same with his managers. Mistakes are seen as learning opportunities.

ANOTHER OPPORTUNITY TO CONSIDER

The company is currently facing a difficult disposal situation. Land application is not allowed, and two of the three local municipal treatment plants have closed, resulting in more driving and longer lines. Moon says they are considering creating their own waste treatment facility.

While challenges will always come along, Moon has no regrets about joining the wastewater industry. "I love it," he says. "I like providing for people; I like giving people opportunities." He's proud of the company's growth that supports so many families. He also finds satisfaction in helping his staff develop their skills so they can move up to better opportunities.

"A lot of my managers started as technicians: The office manager started as administrative help, the vacuum truck manager as a yard assistant and (manager Mike) Campbell was a driver," he says. Constant education is the key. "One thing I always say is you can never stop learning. If you do, you're going to go backward, whether it's individually as a person or as a company." ■

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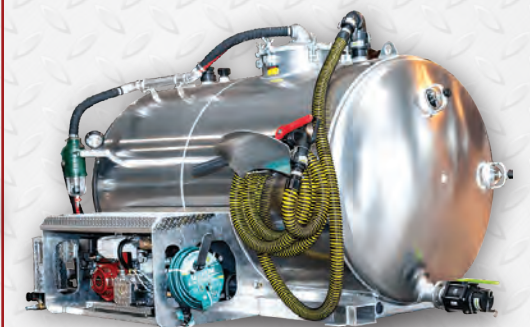
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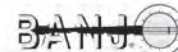
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Jeff Haden is a contributing editor for Inc.com and a LinkedIn Influencer. He is the author of *The Motivation Myth: How High Achievers Really Set Themselves Up to Win*.

Your Employee Just Asked for a Raise. What's Next?

It takes guts to approach the boss and ask for more money. Treat the request with respect, and follow these important steps before you blurt out a yes or no. **By Jeff Haden**

Years ago, I got fired over problems that arose regarding an employee's raise. So I may care a little more about what you should say, and do, when an employee asks for a salary increase.

But you should care just as much because how you handle the raise request will immediately impact your employee's motivation, performance and, ultimately, the success of your entire team. Let's make sure the outcome is positive — even if you have to say “no.”

We'll break down the process into three stages:

What to know before your employee asks for a raise

Let's start with some basics. What a particular employee may need is certainly important, but it should not be part of the discussion. Some employees have families. Some have lots of bills. Some have major expenses to pay off. While it may sound harsh, no matter how pressing an employee's need, their pay should always be based on their value to your business. Not their needs.

Make sure you're prepared to discuss hard numbers, not just opinions. Before you meet:

- Check your payroll system to see what the employee's current salary or wage is and how that compares to others in similar roles and of similar performance.
- Read through previous performance reviews and action plans.
- Check other tools you use that collect data, like your CRM software or POS system, to see employees' sales figures and progress against targets, if it applies to the employee's job.

Higher pay should result from greater value provided — so make sure you know just how valuable your employee is.

How an employee performs compared to their peers is important, but it shouldn't be a part of the discussion. Maybe Jim does outperform Jessica. Maybe Melody does outperform Mark. However, engaging in that discussion opens a can of worms you can never close.

(Besides, great bosses *never* discuss another employee's performance.)

The only thing that matters is your employee asking for the raise. What they've done (and how they did it), what they've achieved, and what value they create. Be prepared to shift the focus back to your employee and their accomplishments.

Your company's financial position is certainly important, but it should only be a small part of the discussion. Your employees should already know if cash flow is extremely tight. So don't automatically respond with some version of “You know I can't afford to pay you more” and end the conversation.

If money is tight, feel free to say so. But be prepared to quickly move

While it may sound harsh, no matter how pressing an employee's need, their pay should always be based on their value to your business. Not their needs.

on to discuss your employee's performance, and if your answer will be “no,” what the employee can do to someday earn that pay increase.

How to respond when your employee asks for a raise

An employee comes to your office, closes the door and says, “I want to talk to you about getting a raise.” While the thought might make you uncomfortable, put yourself in your employee's shoes. It's hard to ask for a raise. (Have you ever done it? Nope. Me neither.) They're nervous. They're uncomfortable. They're putting their professional relationship with you on the line.

Don't blow the moment by deflecting or demurring. Embrace the moment for what it is: an opportunity to have a meaningful conversation with a valued employee. Nod your head and say, “Great. Let's talk about it. Tell me why you feel you deserve a raise.”

And then listen. Don't argue. Validate your employee's feelings by giving them the opportunity to talk. And if you do ask questions, make sure they're clarifying questions. In short, seek to understand. Then respond.

If you're a great boss, chances are your employee is already paid fairly. But if you decide your employee does deserve a raise, don't just say “yes.” Explain why. Make sure the employee doesn't just feel you “gave” a raise. (Or somehow gave in.) Make sure they understand they earned it. In short, if your employee's accomplishments persuade you that they're underpaid, rectify the situation.

But if that's not the case, you'll have to say no. But don't stop there. Offer hope, and more important, offer a path by explaining exactly what your employee will need to do in order to earn a raise.

Here are some ideas you can give them:

- **Create a side project.** Excelling at an assigned project is expected. Excelling at a side project makes people stand out. The key is for your employee to take a risk while making sure your company or customers don't share that risk.

- **Raise less issues, solve more problems.** Plenty of people take verbal stands. Fewer put effort behind their opinions and back them up with research and work product. Instead of showing everyone how smart they are by pointing out a problem, the best employees fix the problem. Encourage



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your employee to do the same.

• **Be the person who drives important results.** No matter the business, one or two things truly drive results. Maybe it's quality. Maybe it's service. Maybe it's being the low-cost provider. Other aspects are important, but for every business, one or two are absolutely make-or-break. The best employees focus most of their efforts on those areas because that will help the business succeed.

• **Do the next job.** Most people wait to get a raise before they consider working harder. The smart approach is to work harder now so employees can prove they're capable for the next more advanced, higher-paying job. Great employees say, "I want to earn more ... so I will do everything possible to prove I should make more money."

Hard work always comes before the reward.

And one last point. If you suggest ways an employee can earn a raise

and they're unwilling, that's OK too. Ultimately, all you can do is lay out the path. Your employee will decide whether they wish to walk that path.

What to do after you've had the raise request conversation

As a boss, the worst thing you can do after an employee asks for a raise is pretend the conversation never happened. You may be tempted to forget it, especially if things didn't go particularly well. But your employee definitely won't forget. Use that fact to your advantage.

Follow up. Ask how a project is going. Ask how a development plan is progressing. Ask about problems solved, informal leadership roles assumed or unusually positive outcomes. In short, follow up because it shows you care, you take their initiative seriously and you want to motivate them for the future. Follow up because it shows you want them to get that raise. ■



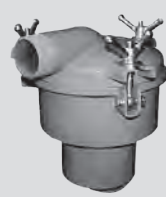
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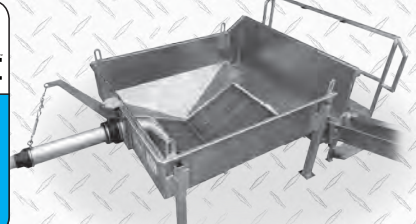
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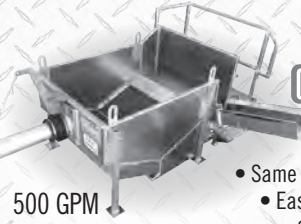
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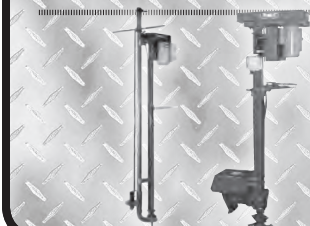
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Jim Anderson, Ph.D., is an emeritus professor at the University of Minnesota Department of Soil, Water and Climate and recipient of the pumping industry's Ralph Macchio Lifetime Achievement Award. Email Jim questions about septic system maintenance and operation at editor@pumper.com.

Look for User Error With Failed Pressure Distribution Systems

A real estate septic inspection uncovered likely problems with maintenance follow-through by the homeowner or service provider **By Jim Anderson, Ph.D.**

Over the past few months, I have received a few questions and comments that pertain to pressure distribution systems. I have discussed what makes a good pressure distribution system and the advantages to using these systems. By spreading the effluent out during the day (time) and across the entire treatment area (space), treatment efficiency can be increased and provide a system that will last indefinitely.

The downside of using pressure distribution is there are more design and installation factors to consider. If the system is not designed or installed properly, it will likely fail prematurely and be relatively more expensive to repair or replace. To use pressure distribution requires not only the usual understanding of site and soil conditions, but also an understanding of pumps and flow through the supply and lateral lines. If mistakes are made in pump sizing and design flow rates through the piping, problems will usually show up very quickly.

This is the description of a problem site during a real estate time-of-sale inspection: "I was recently contacted by a homeowner selling his home. His potential buyer had contracted another septic company to perform an inspection of the current system, which is original to the dwelling and installed sometime in the early 1990s. The absorption area consists of four in-ground pressure-dosed trenches, and the inspection showed the uppermost (highest elevation) trench had 6 inches of effluent in the aggregate, the next lowest had fully saturated aggregate, and the lowest two each had dry aggregate."

UNEVEN DISTRIBUTION

For purposes of a real estate transfer, it's my opinion this system would be unacceptable because it is not working the way a pressure distribution system should work. The flow is ending up in only two of the trenches and more is ending up in the second downslope trench. Since effluent is not distributed equally — and anytime effluent is ponded in a pressure trench or bed — the system is broken. The conclusion of a broken or nonworking system should be straightforward. What is not straightforward is determining the problem and a solution so the property can be sold.

There are several possible reasons for the condition found by the installer. Determining the reason for the condition requires additional research and exploration. A good place to start is to obtain the initial design. If the person selling the house was the owner at the time of system installation, they should have a copy of the initial design and the as-installed diagram. The homeowners probably don't know, but they should be asked.

Next, the county or permitting authority office should have a copy of the completed system design and installation. Since this system was installed

almost 30 years ago, they may not have one either. In that case further on-site investigation should be conducted to see if there are additional pieces to the system, such as a pressure manifold vault or use of flow-switching devices.

Designing and installing pressure distribution systems where distribution laterals are at different elevations is more complicated than designing a pressure bed (such as in a mound system) or series of trenches where the laterals are at the same elevation. In my opinion, it means designing laterals with different perforation diameters to compensate for the pressure differences due to the elevation changes. The goal is to deliver the same amount of flow within a 10% variation to each of the trenches; this is considered even distribution.

Since the system was installed in the 1990s, it is likely this was not the design; instead, it was probably designed with flow to the trenches controlled by a series of valves to be adjusted to supply the proper flow. In one potential scenario, flow in the trenches is not under pressure at all! In this situation, effluent is pumped to a manifold and delivered to the trenches either in parallel or sequentially controlled by valves in a manifold vault.

I have often heard people say they have a pressure system because they have a pump. They really have a pump-to-gravity situation. The trenches will act like any other set of gravity trenches where a biomat will form and effluent will pond in the trench.

SOMEONE SHUT OFF VALVES

The installer indicates the dose tank was located uphill from the manifold, which was in the center of the trenches. It appears the goal here was not to deliver by gravity but to pressurize the entire lateral system; and for some reason, in either the gravity or pressurized scenario, effluent is not being delivered to all trenches.

A common scenario I have seen is where two of the valves were shut off. This may have been by design to rest one-half the system and switch to the other half on a set schedule. They may have been closed by a previous service provider during service and not turned back on. Another possibility is that the homeowner performed system management and did not follow through on the switching schedule. In any case, the result would be similar — more effluent would end up in the lower trench, leading to ponding and eventually surfacing.

Whatever the case, the correct call here is the system is not operating the way it should. The system needs to be fixed to operate the way it was designed or replaced. The buyer and seller should agree about how the system is going to be fixed and who is going to pay for it before the property changes hands. ■



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2013 Peterbilt 388, Cummins 500 HP, 18 spd, 20# fronts, quad axle, 4200 gallon steel vac, Masport 400 vac pump.

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1-YEAR NATIONWIDE DRIVE TRAIN AND EMISSIONS WARRANTY



2012 Peterbilt 367, Cummins 500 HP, 18 spd, 20# fronts, tri-axle, 4650 gallon steel vac, NVE vac pump.

Call For Pricing!

1-YEAR NATIONWIDE DRIVE TRAIN AND EMISSIONS WARRANTY



2014 International 4300, MFDT 230 HP, auto NON CDL, **NEW** 1870 gallon steel vac tank, **NEW** Masport Viper pump.

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1-YEAR NATIONWIDE DRIVE TRAIN AND EMISSIONS WARRANTY



2012 International, MFDT 230 HP, 6 spd, low miles, 33# GVW, **NEW** 2450 gallon steel vac tank, **NEW** Jurop vac pump.

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1-YEAR NATIONWIDE DRIVE TRAIN AND EMISSIONS WARRANTY



2009 International 4300, MFDT 285 HP, Allison auto, low miles, **NEW** 2300 gallon steel vac tank, **NEW** Jurop PN84 vac pump.

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1-YEAR NATIONWIDE DRIVE TRAIN AND EMISSIONS WARRANTY



2012 Peterbilt 365, Cummins 425 HP, jake, 8LL spd, 13,200 front, **NEW** 3360 gallon steel vac tank, **NEW** Masport Hydra pump.

Call For Pricing!

1-YEAR NATIONWIDE DRIVE TRAIN AND EMISSIONS WARRANTY



2008 Mack CXU613, Mack 445 HP, jake, 18 spd, 14,600 front, used 4200 gallon steel vac tank, used Masport 400 pump.

\$61,500

1-YEAR NATIONWIDE DRIVE TRAIN WARRANTY



2020 Kenworth T370, 350 HP, jakes, Allison auto, **NEW** 3500 gallon steel vac tank, **NEW** Masport Hydra vac pump.

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2020 Freightliner 108SD, Cummins - 370 HP, Allison Auto., 4200 Gal. Aluminum Tank, 4310 NVE Blower, Remote System.



2020 Freightliner M2 106, 300HP Cummins L9, Allison Auto, Air Ride, Diff Lock, 2500 Gal. Imperial Tank with NVE 607 Pump.



2020 Freightliner M2106, 300HP Cummins, Allison Auto., 1900 Stainless Steel Portable Service Trucks.



2020 Freightliner M2106 350HP Cummins, Allison Auto., Full Lockers, 4000 Gal. Alum., 4307 Blower.



2015 Western Star 4900SA, DD15 - 505 HP, 13-Spd, 3.73 Ratio, 191" WB.



2012 Stephens 4,620 DOT 407 Tank, Berkeley Pump, Two Baffles, 20" Manhole, Hose Trays.



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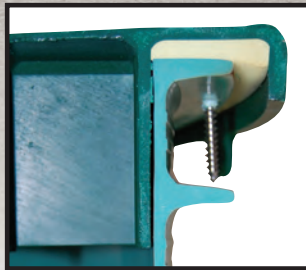
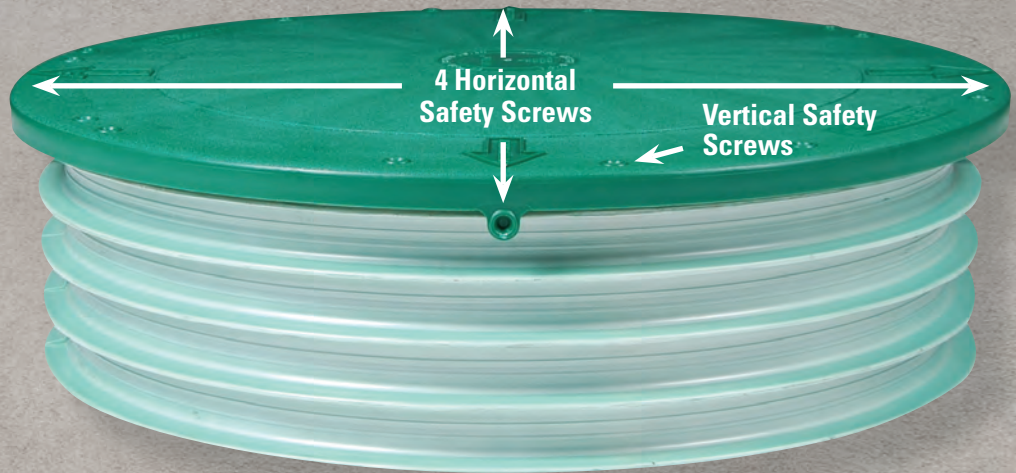
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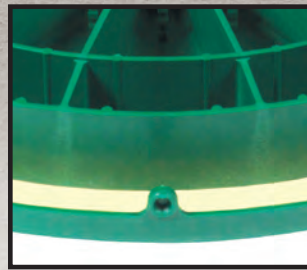
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- Corrugated Pipe

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 WITHOUT CONCRETE CENTER**



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Foamed-in Permanent Polyurethane Gasket.



Holds up to 70 lbs of Concrete for Added Safety.



Water-TITE™ Joint Vertical and Horizontal Safety Screws

4" Effluent Filter and 4" T-Baffle™

86 ft. of 1/16" filtration area.

Increases time between filter cleaning.



EF-4 Combo Includes Filter, Housing and

4" Sch. 40 & SDR-35

NSF®
 800 GPD
 ANS/NSF
 Standard 46

NSF®
 COMPONENT
 ANS/NSF
 Standard 46

EF-4 Combo 18

NSF®
 COMPONENT
 ANS/NSF
 Standard 46

TB-4-18 Housing
 12/carton

SD-4
 Gas/Solids Deflector

4" Effluent Filter EF-4

One-piece effluent filter fits in 4" Sanitary Tee.

- Injection molded PolyPro
- Simple to install - Easy to clean

4" Sanitary Inlet/Outlet T-Baffle™

Injection molded T-Baffle™.

- Injection molded T-Baffle
- Fits 4" Sch. 40 and SDR-35 pipe
- Simple to install
- May also be used as Inlet & Outlet Tee

6" Effluent Filter and 6" T-Baffle™

244 ft. of 1/16" filtration area.

Increases time between filter cleaning.



EF-6 Combo Includes Filter, Housing and Bushing

4" Sch. 40 & SDR-35

NSF®
 1500 GPD
 ANS/NSF
 Standard 46

NSF®
 COMPONENT
 ANS/NSF
 Standard 46

TB-6 Housing

Gas/Solids Deflector

6" Effluent Filter EF-6

One-piece effluent filter fits in 6" T-Baffle™.

- Injection molded PolyPro
- Simple to install
- Easy to clean




6" Sanitary T-Baffle™

Injection molded T-Baffle™.



- Injection molded
- Fits 4" Sch. 40 and SDR-35 pipe
- Simple to install
- May also be used as Outlet Tee with Solids Deflector

ATU 2020 DIRECTORY

MANUFACTURER	BRAND	GPD	RELEASED	DESCRIPTION	DISTRIBUTOR LOCATIONS
 <p>BioMicrobics Inc. 16002 W 110th St. Lenexa, KS 66219 913-422-0707 Fax: 913-422-0808 jcisneros@biomicrobics.com www.biomicrobics.com</p> <p>See ad, page 27</p>	FAST, FITT-ee, RollsAIR, BioBarrier	150 to 2 million	1996	These advanced, integrated, wastewater treatment systems are ideal for residential and commercial applications; MyFAST, MacroFITT, and RollsAIR systems are for larger applications with less maintenance. With the SFR feature of the FAST technology, alternate modes of operation include reduced electricity usage up to 45%, increased nitrification/denitrification processes, long-term performance goals, and/or wastewater recycling opportunities. The effluent meets secondary quality requirements and can be distributed to a soil treatment system or water reuse applications. BioBarrier MBR is for Ultrafiltration of the wastewater treatment process to remove 99.9% of the contaminants. Certified to NSF/ANSI 40 class 1, 245 (nitrogen reduction), 350 (water reuse) and EN12566-3 standards.	Global
	SciencoFAST BioBarrier MarineMBR, SaniLIFT, SciCHLOR, SciBRINE	150 to 200,000	1985	A global manufacturer of Type II Marine Sanitation Devices, as well as Water Management Solutions for Agriculture, Commercial Food & Beverage markets, Municipal Water Treatment, and providing environmentally-friendly maintenance products and cleaners. The Scienco SciCHLOR and SciBRINE can be used in various applications, such as various chemical processes, disinfection, etc. The Scienco/FAST knowledge, long term proven history and performance, the company received many awards for Innovation in Marine Environmental Technology and Integrated Water Leadership certified by EPA, Coast Guard and IMO Effluent Requirements, as well as the Scienco Products received NSF 61 certification.	
	SeptiTech STAAR	500 to 150,000+	1996	Received the EPA's Environmental Technology Innovator award as an advanced, Trickle Filtration Sewage Solution, these Smart Trickling Anaerobic/Aerobic Recirculating Filter Systems are designed for both residential and commercial properties with minimal operator oversight, while delivering consistent high quality treatment even during peak, low or intermittent flows. Utilizing an unsaturated, engineered textile media, reliable equalization/clarification process and maintains low levels of Nitrate-N with all below-grade components. The PCL Smart technology allows the system automatically goes into a sleep mode to achieve lower operating costs and power requirements. Systems are ETV-EPA verified, NSF/ANSI Standards 40/245 certified and achieves Provisional Use Performance Requirements.	
 <p>Delta Treatment Systems 9125 Comar Dr. Walker, LA 70785 800-219-9183 • 225-665-6162 info@deltatreatment.com www.deltatreatment.com</p>	DF Series	500 to 1,500	1993	The process occurs entirely within the self-contained treatment unit which is comprised of outer mixing tank and a cone-shaped settling chamber. Raw, unsettled domestic wastewater enters directly into the mixing tank where mixing occurs through an air distribution system. The mixed liquid then enters the settling chamber from the bottom. The settling chamber maintains a quiet condition which allows solids to settle down and re-enter the mixing chamber for more processing. The liquid is hydraulically displaced upward and is discharged as a clear, odorless treated water which meets or exceeds state water quality standards.	AL, AK, AZ, BC, BWI, CA, CO, FL, GA, HI, ID, IL, IN, IA, KY, LA, ME, MI, MD, MN, MO, MS, MT, NC, NM, NV, NY, OH, OK, ON, OR, TN, TX, UT, VA, WA, WI, WV
	ECOPOD	500 to 100,000	2006	The ECOPOD Advanced Wastewater Treatment System is a FFBR (fixed film bioreactor) system that houses an engineered PVC media specifically designed to treat domestic wastewater. Five models accommodate daily flows ranging from 500 to 1,500 gpd, with customizable options available for commercial applications up to 100,000 gpd. The ECOPOD is ideal for individual residential installations, cluster designs, and small-to-medium commercial wastewater treatment applications. Self-contained, it can be inserted into a standard-sized septic tank or vault providing quiet, odorless operation. ECOPOD is certified to ANSI/NSF International Standards 40 and 245, FHA and VA acceptable, and suitable for intermittent usage.	
	Enviro-Aire Series	500 to 1,500	2005	The plant achieves treatment by a flow through process. Raw sewage enters a primary chamber, which has a hydraulic capacity of 346 gallons, providing a retention time of 16.6 hours. This chamber provides for separation of heavy, easily settled solids as well as floatable materials such as grease. Settleable solids accumulate on the bottom and floatable solids accumulate on the surface. Effluent from the clear layer flows into an aeration/mixing chamber with a 28-hr retention time. An aeration system provides for oxygenation of the primary effluent with the wastewater in the aeration/mixing chamber. Air is introduced by passing from the air pump to the air drop-line located in the chamber. The mixed liquor enters the settling chamber at the bottom and travels upward toward the discharge pipe. The quiet condition allows solids to settle down and re-enter the mixing chamber.	IL, LA, MS, TX

MANUFACTURER	BRAND	GPD	RELEASED	DESCRIPTION	DISTRIBUTOR LOCATIONS
 <p>Eliminite, Inc. PO Box 359 Belgrade, MT 59714 888-406-2289 info@eliminite.com www.eliminite.com</p>	Eliminite Grizzly	Up to 50,000	1997	The Eliminite Grizzly system is designed for large-scale, high-volume, high-strength commercial applications where advanced nitrogen reduction is necessary. The system was originally developed to serve high-altitude commercial and resort developments in the Rocky Mountains where winter temperatures linger at or below 0 degrees F, and seasonal use patterns/dramatic fluctuations in flow and wastewater strength are the norm. It functions with little operator input and simple maintenance. C-Series systems serve high-altitude highway rest areas, resort communities, golf courses, ski areas, mixed-use residential communities, restaurants, RV parks, work camps, corporate retreats, business parks and convenience stores. It is suited for use in multi-stage treatment trains and as a means of reducing waste strength prior to conveyance to municipal treatment facilities.	US
 <p>Eljen Corporation 90 Meadow Rd. Windsor, CT 06095 800-444-1359 www.eljen.com See ad, page 28</p>	GSF	Scalable to site conditions	1982	The Eljen Geotextile Sand Filter (GSF) is an advanced wastewater treatment and dispersal technology. The GSF's unique design provides treatment and dispersal in the same footprint while keeping installations easy and maintenance minimal.	North America and Australia
<p>Fuji Clean USA 41-2 Greenwood Rd. Brunswick, ME 04011 207-406-2927 Fax: 207-406-2929 info@fujicleanusa.com www.fujicleanusa.com</p>	CE	450 to 2,700 (6 Models)	2010	Fuji Clean's CE model series averages 50,000 systems being installed annually worldwide. The popularity is driven by a small footprint (about 7' x 4' for CE5), low power draw (1.1kWh/day for CE5), easy plug & play installation and simple, efficient O&M and consistent treatment (95% BOD and TS removal, NSF 40 certified, no preceding septic tank). There are no moving parts in the "contact filtration" treatment process. One 80 L/min external air blower (FujiMAC Series) introduces oxygen into aerobic chambers and powers internal air lift pumps, which facilitate sludge return and discharge of clean effluent.	Most States
	CEN	450 to 1,900 (4 Models)	2010	Fuji Clean's CEN technology provides enhanced denitrification into its standard contact filtration treatment process and produces a consistent high quality effluent (NSF 40/245 certified: 5 BOD, 6 TSS and 10 TN) from straight septic wastewater – no preceding septic tank necessary. There are no moving parts in the treatment process. Extremely compact (about 8' x 4' for CEN5), lightweight (about 475 lbs for CEN5), highly maneuverable and features a low power draw (one 80 L/min blower drawing 1.1 kWh/day for CEN5), plug & play installation and optional wireless telecommunication package that offers both dial and text capabilities. A proprietary electrolysis-based phosphorus reduction option is also available with this system.	
	CE6KG	6,000	2015	Fuji Clean's largest CE commercial system, is now available to supplement its existing CE21 (1,900 gpd) and CE30 (2,700 gpd) models. The CE6KG, which can treat up to 6,000 gpd, uses the same treatment technology, process flow and one-tank structure as the smaller CE systems and can be squeezed into the tightest of sites. The footprint size on the CE6KLG is only 36' x 6.5' (including built-in septic tank).	
 <p>Hoot Systems, LLC 2885 Highway 14 E Lake Charles, LA 70607 888-878-4668 • 337-474-2804 questions@hootsystems.com www.hootsystems.com See ad, page 57</p>	LA-Hoot	500 to 1,000	1986	LA-Hoot is an improved version from the original Hoot Treatment System introduced in 1984. Results are better than 10/10 mg/L on CBOD asd TSS, with more than a 95% reduction of the wastewater influent. Two-year warranty/NSF Standard 40 certified.	Nationwide
	H-Series	500 to 1,200	1995	Five-stage, one piece system with a pretreatment tank, aeration chamber, final clarifier, optional disinfection device and a pump tank. Results are better than 5/5 mg/L on CBOD/TSS. A 99% reduction on CBOD and TSS. Marketed as BNR in MD and FL with Biological Nitrogen Reduction of >50%. Three-year warranty/NSF Standard 40 certified.	

MANUFACTURER	BRAND	GPD	RELEASED	DESCRIPTION	DISTRIBUTOR LOCATIONS
<p>(Continued)</p> <p>Hoot Systems, LLC 2885 Highway 14 E Lake Charles, LA 70607 888-878-4668 • 337-474-2804 questions@hootsystems.com www.hootsystems.com</p>	ANR	450 to 900	2007	Adds Advanced Nutrient Reduction to the Hoot System. Results of 5.8 mg/L on TN, better than 10/10/10 mg/L on CBOD/TSS and Total Nitrogen. Areas where 10 mg/L is the discharge limit for Total Nitrogen, the federal level for drinking water. Three-year warranty/NSF Standard 40 and 245 certified.	Nationwide
	MTS	3,000 to 500,000	2011	The Hoot MTS, (Media Treatment System) is a series of larger treatment systems that were tested and verified under NSF Standard 40/245 protocol. The Hoot MTS is used for Residential, Commercial and High Strength wastewater applications and can also be set up to treat for Ammonia, Total Nitrogen, Phosphorus and other discharge parameters. Instead of selling a one size fits all box, or multiple boxes, Hoot can deploy our MTS technology into locally sourced concrete castings, retrofit into existing structures or fabricated for new, poured in place vessels. We have substantial experience with RV parks, camps, convenience stores, restaurants, shopping plazas, schools, churches, brewery/winery tasting rooms and other challenging applications.	
 <p>Jet, Inc. 750 Alpha Dr. Cleveland, OH 44143 800-321-6960 • 440-461-2000 Fax: 440-442-9008 email@jetincorp.com www.jetincorp.com See ad, page 32</p>	J 1500 BAT Media Plant; J 500-800 PLT	500 to 1,500		Jet's residential wastewater treatment plants employ the Jet BAT Process Media which provides the ideal environment for nature's own bacteria to thrive and grow. Great numbers of these living microorganisms attach themselves to this submerged structure to create a "biomass" that rapidly treats wastewater. The Jet 700++ Aerator provides the mixing and fresh oxygen the microorganisms require to live while the Jet BAT Process Media provides the environment to support the microorganisms that allow natural filtration and biological reduction to take place. Available in concrete and plastic.	US and International
	R-Series	450 to 1,500			
 <p>MST Manufacturing, LLC 23362 Medero, Ste. C Mission Viejo, CA 92691 877-473-7842 • 949-297-4590 Fax: 949-916-2093 microseptec@microseptec.com www.microseptec.com</p>	EnviroServer	600, 1,200 and 2,500	1998	The EnviroServer ES is a combination of primary treatment, flow equalization, and secondary treatment by both fixed-growth and suspended-growth aerobic processes. The system consists of five chambers in one compact pre-engineered unit. The first chamber is a primary clarifier, the second chamber is the first aeration zone, the third chamber is the second aeration zone, the fourth chamber is the final clarifier, and the fifth chamber is the effluent chamber where an optional pump(s) and disinfection device may be installed.	AZ, CA, DC, DE, MD, NJ, NV, PA, VA
 <p>NEXTGEN SEPTIC NextGen Septic, LLC 1776 Mentor Ave. Cincinnati, OH 45212 513-262-9506 sales@nextgenseptic.com www.nextgenseptic.com</p>	NextGen Advanced	1,200		NextGen Advanced with Septigen technology is a three-stage, compact, wastewater treatment solution that saves water, saves money and saves the environment. In stage one, simultaneous biological aerobic and anoxic treatment of the organic material breaks down solids and treats nitrogen and phosphorous through a combination of proprietary biomedica and high-capacity aeration technology. Then, membrane separation phase treats water for nitrogen and phosphorous in addition to filtrating and treating any remaining suspended solids. Ozone disinfection technology is used as a final stage to ensure treated water meets surface discharge and reuse standards.	Nationwide
	NextGen Retrofit	1,200		NextGen Retrofit with Septigen technology can be installed into any approved, existing septic tank and works to repair a clogged soil drain field in as little as 8-12 weeks. By eliminating the cost of excavation and tank removal as well as the cost of replacing or extending the drain field area, NextGen saves the homeowner tens of thousands of dollars on installation alone. And, the low-maintenance design gives them peace of mind that the field will remain clear in the future. NextGen technology features a compact, stand-alone, automated, two-stage treatment system for domestic sewage that removes nitrogen phosphorous.	
	NextGen Community	1,500 to Unlimited		NextGen Community Septic Systems are advanced multi-home sewage treatment systems that are hybrids between a packaged treatment plant and an advanced septic system. The system design eliminates the need for large septic tanks in each yard, creates a stand-alone treatment system that removes traditional contaminants plus nitrates and phosphorous, and provides graywater irrigation usable for community greenspace. The NextGen system uses Septigen technology, a patent-pending, multi-stage treatment process that includes simultaneous aerobic and anoxic treatment, high-capacity aeration, membrane separation and disinfection.	

MANUFACTURER	BRAND	GPD	RELEASED	DESCRIPTION	DISTRIBUTOR LOCATIONS
 <p>norweco[®] Engineering the future of water and wastewater treatment</p> <p>Norweco, Inc. 220 Republic St. Norwalk, OH 44857 800-667-9326 • 419-668-4471 Fax: 419-663-5440 email@norweco.com www.norweco.com See ad, page 39</p>	Hydro-Kinetic	500 to 1,500	2012	The Hydro-Kinetic wastewater treatment system employs innovative Hydro-Kinetic filtration technology to produce the cleanest, most consistent effluent quality available. They Hydro-Kinetic system uses the extended aeration and attached growth processes to treat wastewater, and features innovative nitrification-denitrification technology. The Hydro-Kinetic FEU system is the only NSF/ANSI Standard 40 and 245 certified residential wastewater treatment system to pass two consecutive back-to-back tests without performing routine maintenance for a full 12 months. It quietly, efficiently and automatically pretreats, aerates, flow equalizes and filters all wastewater returning only the purest effluent back to the environment.	North America, Central America, South America, Europe, Africa and Middle East
	Singulair Model 960 and Model TNT (Total Nitrogen Reduction)	500 to 1,500	1996, 2006	The Singulair system is the state-of-the-art alternative to a troublesome septic tank for domestic wastewater treatment. Employing the extended aeration process, the Singulair plant provides flow equalization, pretreatment, aeration, clarification, tertiary filtration and optional chemical addition within a single precast concrete tank. Designed for domestic wastewater flows ranging from 500 to 1,500 gpd, performance of the Singulair system is certified by NSF International (Standards 40 and 245) and the Canadian Standards Association.	
	Singulair Green Model 960 and Model TNT (Total Nitrogen Treatment)	500 to 1,500	2010	The Singulair Green aerobic treatment system incorporates Norweco's advanced aerobic treatment process into a durable, watertight polyethylene tank. It is ideal for new or retrofit applications and can be installed easily in the most difficult jobsite with just a backhoe. Incorporating support ribs and inherently strong arch shape, the durable Singulair Green tank will provide decades of reliable performance. Designed for domestic wastewater flows up to 600 gpd, with treatment performance meeting or exceeding the strictest state and county requirements, Singulair Green is certified by NSF International.	
	Singulair R3 and Singulair R3 Green	500 to 1,500	2018	The Singulair R3 REDUCES water consumption, REUSES treated effluent and RECYCLES water to conserve and recharge our groundwater. It provides the cutting-edge solution to chronic water shortages and reduces energy costs of water and wastewater treatment. The system efficiently treats incoming wastewater to the highest level for restricted indoor and unrestricted outdoor use.	
	Singulair Solar	500 to 1,500	2020	The Singulair Solar system delivers an environmentally friendly solution for onsite wastewater treatment by utilizing renewable solar energy to generate electricity. Solar power is a 100% clean, renewable energy source that offers year round efficiency and reduces your carbon footprint. Singulair Solar technology requires no moving parts, providing quite, efficient operation with minimal maintenance.	
 <p>Presby Environmental, Inc. Presby Environmental 143 Airport Rd. Whitefield, NH 03598 800-473-5298 info@presbyeco.com www.presbyenvironmental.com</p>	Advanced Enviro-Septic	Scaleable		Advanced Enviro-Septic (AES) is a passive treatment and dispersal system. This effective and non-mechanical onsite system is designed for residential, commercial, and community use. AES has been proven to remove up to 99% of wastewater contaminants without the use of electricity or replacement media. AES does this quickly and naturally establishing multiple bacterial treatment environments throughout the system that break down and digest wastewater contaminants leaving the septic tank. This passive process allows the system to discharge highly purified wastewater, preventing soil clogging and groundwater contamination. AES has third party certifications from NSF, Cebedeau, BNQ, and SAI Global.	Most US States and 14 Countries

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Max. GPM.	Max. LMP	Max. PSI	Max. Bar	Max. RPM	Req. HP	RTX 30.500N
8.0	30.3	7250	500	1450	24.3	

RTX 50	Max. GPM.	Max. LMP	Max. PSI	Max. Bar	Max. RPM	Req. HP
	12.0	45.4	4350	300	1450	27.2

Max. GPM.	Max. LMP	Max. PSI	Max. Bar	Max. RPM	Req. HP	RTX 60
14.0	53.0	4350	300	1450	47.2	

RTX 70	Max. GPM.	Max. LMP	Max. PSI	Max. Bar	Max. RPM	Req. HP
	17.0	64.4	3000	200	1450	25.4

Max. GPM.	Max. LMP	Max. PSI	Max. Bar	Max. RPM	Req. HP	RTX 85
21.0	85.0	3000	200	1450	34.0	

RTX 100	Max. GPM.	Max. LMP	Max. PSI	Max. Bar	Max. RPM	Req. HP
	24.0	90.8	1800	124	1450	27.2



For More Information Contact

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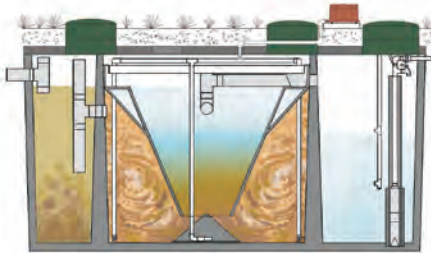
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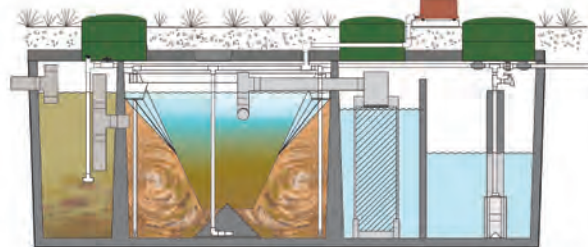
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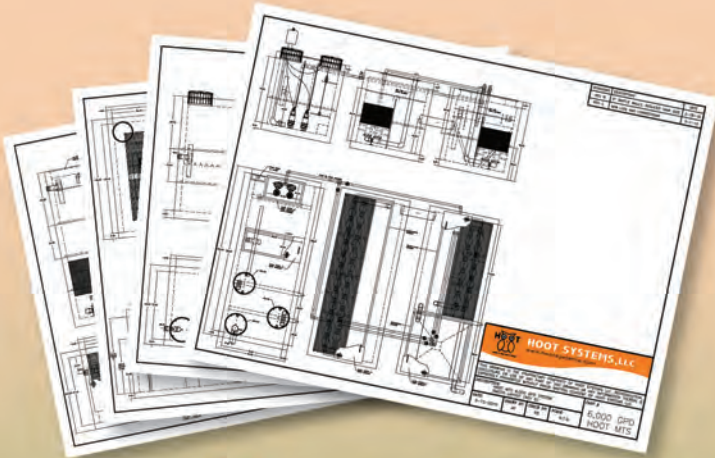
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Hoot - ANR

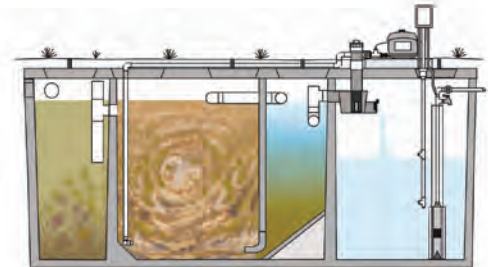


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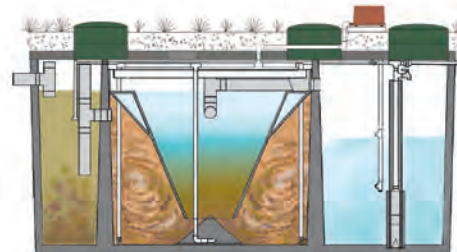


LA - Hoot

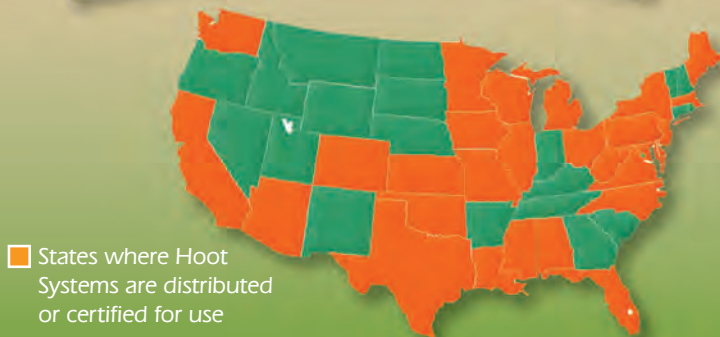


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States where Hoot Systems are distributed or certified for use

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Follow These Tips and Get the Most From Your Vacuum Pumps

The wheels still roll, but lose suction power and your truck might as well be dead on the side of the road. A proper maintenance plan will keep you pumping on the busy days ahead. **By Jared Raney**

A vacuum pump is the beating heart of your septic or portable sanitation service truck. You pull the lever and expect it to work hard and perform reliably every day. As such, a solid preventive maintenance routine is the key to avoid unexpected — and costly — breakdowns.

Fred Hill, owner of Washington, D.C., Gotta Go Now, committed to a rigorous routine pump maintenance schedule early on for his portable sanitation and pumping company, and the savings he reaped are impressive.

“I didn’t do it the first year, and that forced me into a position where I ended up buying pumps to replace,” Hill says. “After that I said, ‘Hey, we can do preventive maintenance and save a ton of money,’ and at that point we put into place the regular maintenance program to keep us from having to buy pumps all the time.”

As important as knowing the proper steps to take is building a routine and getting drivers to commit to that schedule.

“When the truck drivers arrive in the morning, they’re required to do their pretrip, and part of that is to drain down the pumps if they hadn’t done it the day before,” Hill says. “Sometimes they come (back to the shop) pretty late, so I don’t ask them to do it every evening. But at least before they go out the next morning, they need to drain down the catch reservoir and then refill the fill tank with clean oil, thereby keeping the pump ready to use.”

CAN’T TAKE THE HEAT

The foremost downfall of vacuum pumps is overheating, and a single maintenance item — possibly the simplest of all — is often responsible.

“A big factor that we’re finding to be a problem is people aren’t cleaning the pump, and they’re letting mud build up on the pump,” says Todd Devecsery, national sales manager with Fruitland. Many pumpers are in the habit of keeping their pumps clean, but a refresher for your drivers is always a good idea.

“Don’t let mud build up on your pump. It’ll act like a blanket. Even if your pumps are liquid-cooled, they still need some ambient cooling, and air-cooled pumps rely on heat dissipation. If you’ve got a half-inch of mud built up on it, it’s not going to allow the heat to escape — heat is one of the biggest enemies of the pump,” says John Gilbert, sales manager with pump manufacturer Masport. “Externally, cleaning the pump is literally just pressure-washing like at a car wash.”

Ensuring that the pump is properly oiled can be a factor in overheating, but lubrication also contributes to the longevity of many pump components and efficient pump operation. An often-overlooked piece of pump care is the oil pump. Oil consumption testing can tell you whether the oil pump is operating properly. If it’s not, it could be catastrophic for the pump.



John Gilbert, sales manager at Masport, demonstrates vacuum pump teardown and inspection during the 2019 Portable Sanitation Association International conference. (Photo by Jim Kneiszel)

“Without any oil getting to the vanes, the pump will overheat. The friction will be too great inside the pump, and then it will not operate and it will fail,” Devecsery says.

Leaks are another big danger. Undetected leaking can potentially lead to damaging increased friction inside the pump, but it can rob the pump of its ability to create adequate vacuum to get the job done.

“Most people don’t realize this: Without a sealed environment — I mean hermetically sealed, perfectly sealed, 100% sealed — a vacuum truck does not work,” Devecsery says. “A lot of the drivers don’t take that into account.”

Along with regularly checking seals and gaskets for leaks, a simple way to encourage a maintenance mindset is to have drivers routinely check pressure and vacuum. Testing the system with a small amount of pressure and

(continued)



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vacuum for 10 minutes before leaving the shop can help catch issues before they cause downtime, and doing it regularly can help catch issues before they become more serious.

KNOW YOUR PUMPS

Unfortunately, pump care isn't as simple as occasionally giving them a thorough cleaning. Knowing how to run the pump is also key in promoting its longevity. One common misunderstanding is that the relief valves are not typically preset by the manufacturer or builder on vacuum systems.

"Vacuum relief serves adequate air into the tank: The vac relief starts sucking air in and produces what we call air conveyance, and then it pulls the product into the tank," Devcsevry says. "You need to have air to create pressure, and you need to have a relief to allow the system to operate effectively. This is the key caveat of the whole deal: They're not set. So a person gets a brand-new piece of equipment and the reliefs aren't set at all. They have to know how to set them."

Not only can improper settings cause periodic issues on the job site, such as inefficient loading or even pump failure, but they can do more damage over the long haul.

"Knowing your pump speed and knowing to operate the pump at the right speed are crucial for the life of the pump and overheating," Gilbert says. "Have the vacuum or pressure relief valves at the right settings; number one, don't exceed the maximum continuous recommendation for the pump. And then don't set it too high for the actual work you need. Say one of our pumps can run at 25 inches of vacuum continuously — yes, it'll do that all day long, but that's kind of like redlining your car all day long. If you don't need it, don't use it, because the higher vacuum and higher pressure just creates more heat."

START A ROUTINE

One easy tip for incorporating pump maintenance into existing schedules is to tie certain preventive items to planned truck maintenance. For example, Fruitland recommends a checklist of pump maintenance to coincide with truck engine oil changes:

- Set or check the relief valve.
- Full pump flush.
- Check, empty and clean oil reservoir; adjust oil pump if necessary.
- Check rotation speed of pump with laser tachometer.

Some contractors, such as Gotta Go Now, choose to schedule pump maintenance by time intervals: daily draining of catch reservoirs and refilling of fill reservoirs; flushing and seal/leak check monthly; and full tear-down, component replacement and rebuild annually.

Taking the pump apart occasionally for visual inspection ensures that secondary wear isn't occurring on the vanes. Beyond the expected tip tolerances, vanes can wear and cup in the center or become pitted and "mushroomed," not all of which can be seen from inspection ports.

"Personally, I'd rather see the pump opened up for a visual inspection of the whole vane," Gilbert says. "Checking the height is one thing, but actually looking at the vanes — there's other underlying issues that can happen. You can get dimples in the vane slots that'll make the vane hang up and wear at an angle. If there's any glazing on the tips, you can tell the pump has been running with a lack of oil or running too hot."

Gilbert actually recommends flushing on a weekly basis, but it depends on manufacturer recommendations for individual pumps and the amount of use a pump sees day to day. Masport has a series of video resources on its website with flushing guidelines, as well as its recommendations for time-interval maintenance.

"In a perfect laboratory world, theoretically, oil should be coating every surface and the vanes should never really wear out," Gilbert says. "Some jobs

are worse than others, but a lot of the systems do ingest dust and dirt, you get liquid carryover, and that creates wear. Down the road, that'll lead to oil leaking. Maintaining the components is key for keeping your pump alive."

VANE BASICS

Vanes naturally rub against the inside of the pump casing during operation, and if the pump isn't flushed and oiled properly, vanes wear out more quickly. And no matter the diligence in maintenance, some material carryover is inevitable, so vanes may still need to be replaced occasionally.

"Vanes come in different thicknesses and heights; different pump manufacturers should have a wear tolerance on it, as far as when they need to be replaced," Gilbert says. "It's kind of like brake pads. If it gets below a certain amount of wear, you want to replace them."

“Vanes come in different thicknesses and heights; different pump manufacturers should have a wear tolerance on it, as far as when they need to be replaced. It's kind of like brake pads. If it gets below a certain amount of wear, you want to replace them.”

John Gilbert

While vanes used to be made of asbestos-based materials, modern versions are typically made of Kevlar and phenolic resin. It's a durable material, but its resilience shouldn't be taken for granted.

Vacuum pumps can have anywhere from three to eight vanes in a variety of sizes and tolerances.

"You want to keep it within the manufacturer's spec. Differences in materials grow completely different under heat and your tolerances change," Gilbert says. "Looking at some of our vanes, 3/8 of an inch is the maximum height wear you want before replacing them."

When it comes to replacements, most pump companies will sell vane sets, and some will offer full rebuild kits with vanes, bearings, gaskets and seals.

It can be tempting to put this maintenance on the back burner, but it can have a catastrophic effect on the pump if neglected.

"If it gets to a point where it's not going back in the slot like it should, it'll break in half," Gilbert says. "The vanes will fall out of a slot. Then once they wedge up in the top of the cylinder, you're going to break something cast iron."

JUST DO IT

There's perhaps no better way to bring home the point about pump maintenance than comparing the ages of pumps: maintained versus not. Hill says in the early days of his company, before establishing his maintenance program, one of his pumps failed after only about 16 months. Gilbert hears from many customers whose pumps failed after only a handful of years.

On the other hand, lasting a decade is a cakewalk for a well-kept pump, experts say.

"I have a pump right now that is 14 years old and is still being used," Hill says. "If you go out and buy a pump, you're out \$3,000, \$4,000 because you didn't set up a maintenance program, which you're only spending a couple hundred dollars on annually."

The bottom line is that proper pump maintenance for a fleet of vacuum trucks can save pumping companies thousands of dollars over the years.

"Keeping the pump clean, flushed out — that can extend the pump life, keeping your repair costs and downtime costs low," Gilbert says. "The pump is basically the life of the truck, so if it's not working, you have a whole vacuum truck that's basically unusable. You depend on the pump every day." ■

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Jennifer Morris Believes in the Value of Networking

A wastewater trade group helps you connect with fellow contractors and decipher ever-changing industry rules and regulations

In States Snapshot, we talk to a member of a state, provincial or national trade association in the decentralized wastewater industry. This time we visit a member of the Yankee Onsite Wastewater Association.

Name and title or job description: Jennifer Morris, chief executive officer and owner along with husband Gregory Morris

Business name and location: GFM Enterprises, South Dennis, Massachusetts

Services we offer: Septic installations and upgrades, demolition, engineering, road grading, site development, water services

Age: 43

Years in the industry: 33, starting when my family owned Cape Cod Ready Mix

Association involvement: Yankee Onsite Wastewater Association

Benefits of belonging to the association: It helps us learn about new products in the industry. Plus, there are the connections you make. It's just a great way to connect with people and meet new people. And you may form friendships that may lead to jobs. Or, for example, I was talking to somebody the other day and they asked if we knew someone who did asbestos removal and I was able to recommend someone because of somebody I had met at one of the events I attended.

Biggest issue facing your association right now: Keeping up with state laws and regulations. They're constantly changing.

Our crew includes: GFM Enterprises has two administrative staff, three project managers, five project foremen and 15 laborers/drivers.

Typical day on the job: I do a little bit of everything including scheduling, working upcoming bids, invoicing and job site visits.

The job I'll never forget: For the most part, we've been pretty fortunate with the jobs we've done. We come across all kinds of clients. They could be a super joy to work with or they could be extremely difficult. Sometimes you get people who think they know how to install a septic system and then sit there and watch your guys do it and tell them what they're doing wrong.

My favorite piece of equipment: "The Boss Lady." She's an excavator — a John Deere 245. She's just a big, beautiful piece of equipment that they named after me. A lot of times the guys in this industry name their trucks and machines. Kids' names end up on them. My son's name is painted on one of our mini-excavators. His name is Quinn, and we call it the Mini-Quinnie (another John Deere).



Jennifer Morris

Most challenging site I've worked on: We had a job in Provincetown on Cape Cod where we excavated 35 feet alongside the house and two feet away from the house. It was a really tight job site for the machines and the guys getting materials in there. Everything's tight like that in Provincetown. And sometimes on Cape Cod you run into what's called sugar sand. It doesn't cooperate and just keeps on piling down. We ended up shoring it up with some steel so we could continue with the project.

Oops, I wish I could take this one back: We did a ballfield that was poorly engineered, creating lots of issues. For example, certain areas weren't pitched properly and water was pooling. There were probably 50 different issues, and we just dealt with each one as it arose. It's still an ongoing project and should have been completely done by now. The plans came in maybe only 50% complete. Meanwhile, the company we were doing the project for was often trying to put the cart before the horse. You've got to go in a logical pattern so the project pans out the right way. They were just trying so hard to

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move the project along. They would say things like, "If you have nothing to do right now, do this" — but you can't really do that until you've done some other thing. We had to push back.

The craziest question I've been asked by a customer: "Do you know what you're doing?" It's the funniest thing because they hired you to do the job, but people do ask us that. Sometimes my guys are like, "No, I just You-Tubed it."

If I could change one industry regulation, it would be: It would be nice to have a uniform code that carried completely into each town. All the towns here do things differently. The permitting process is the biggest one. You show up and you think you have all your paperwork ready to pull a permit, but then this town requires things no other town requires.

Best piece of small-business advice I've heard: My grandfather, who

founded Cape Cod Ready Mix, always said be honest and treat your employees with respect.

Planning for the future: We're trying to streamline how we do things, both inside the office and outside, so that things run smoother. As far as software, we're always looking to see what's out there.

If I wasn't working in the wastewater industry, I would: I'd love to own a fun boutique geared toward women. Years ago I owned a home decor store.

Crystal ball time - This is my outlook for the wastewater industry: Right now there's a lack of qualified employees, and I think that's going to continue. Finding people with a good work ethic, who will show up and put an effort into what they're doing, seems to be hard. ■

- Compiled by Betty Dageforde

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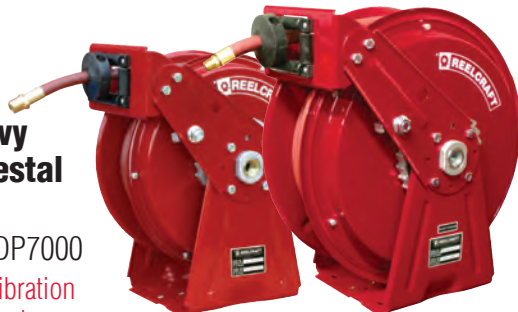
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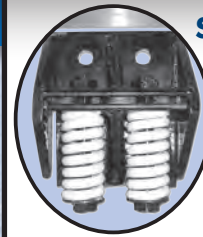
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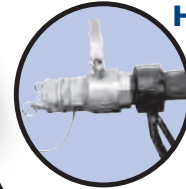
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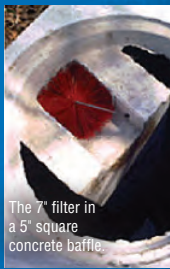
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Location: Montrose, CO

Contact: Lisa Nicoll

cpow@cpow.net

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May 13-14, 2020

Location: Durango, CO

Contact: Lisa Nicoll

cpow@cpow.net

Operation and Maintenance Training Schedule

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March 17-18, 2020

Location: Loveland, CO

Contact: Lisa Nicoll

cpow@cpow.net

CPOW O&M 1

March 17-18, 2020

Location: Video Conference Site,

Montrose, CO

Contact: Lisa Nicoll

cpow@cpow.net

CPOW O&M 2

April 14-15, 2020

Location: Loveland, CO

Contact: Lisa Nicoll

cpow@cpow.net

CPOW O&M 2

April 14-15, 2020

Location: Video Conference Site,

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PRODUCT NEWS



in the
SPOTLIGHT
By Craig Mandli

THE GENERAL PIPE CLEANERS JM-1000 MINI-JET IS DESIGNED TO PROVIDE POWER IN A SMALL PACKAGE

The compact and lightweight **JM-1000 Mini-Jet** from **General Pipe Cleaners/General Wire Spring** is designed for pumping contractors who need mobile tools and to work in tight locations.

The unit provides 1,500 psi of cleaning power, yet weighs just 23 pounds. The pump and motor assembly are safely contained in a rugged, metal diamond plate case designed to handle abuse in the field. The portable unit measures 24 by 10 1/2 by 11 inches. It is available with stainless steel braid/Teflon core hoses in a variety of lengths, designed to smoothly slide down 1.5- to 3-inch drainlines and navigate tight bends. The 3/16-inch Teflon core is designed to reduce flow resistance for improved performance when cleaning small lines.

"This unit is such a great fit for plumbers who need to visit several job sites in one day or for building maintenance personnel working on large buildings," says Marty Silverman, vice president of marketing for General Pipe Cleaners. "It's portable and compact, but it packs a lot of punch."

The unit's jets use a stream of high-pressure water to remove blockages. The thrust of the nozzle drives the hose down the line. Pulse helps the hose slide around tight bends and farther down the line. That pulse breaks initial tension between the surface of the hose and the walls of the pipe, increasing the unit's overall cleaning power.

"It is designed to clear most grease stoppages that occur within 20 feet of the drain," Silverman says. "In that way, it serves as an alternative to a cable machine."

The unit generates 1,500 psi at 1.4 gpm, yet pulls only 13 amps. The pump and motor are enclosed in a metal housing and protected by a ground-fault circuit interrupter. A variety of accessories, such as an optional spray wand, help make it suitable for septic maintenance, according to the maker.

"Small jetting units are becoming more and more popular, and we're very excited by the positive reaction to the JM-1000 Mini-Jet within the industry," Silverman says.

800-245-6200; www.drainbrain.com

CUMMINS X12 ENGINE FOR VACUUM TRUCKS

With up to 500 horsepower and 1,695 lb-ft torque, the Cummins X12 is ideal for septic and sewer vacuum trucks. It provides a high power-to-weight ratio and is also the lightest engine in its class, weighing 400 to 600 pounds less than other engines. The lightweight and durable X12 carries more liquid waste without sacrificing throttle response for frequent stop-and-go duty cycles. A new Cummins engine brake also strengthens stopping power over the ISX12, lengthening service brake life. It is fully PTO capable and, through Connected Diagnostics, X12-powered trucks can be wirelessly connected to Cummins product experts for immediate diagnosis of engine system faults.

www.cummins.com ■



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2019 MACK GU713 ROLL OFF TRUCK

MACK MP8 @ 455 HP, 8LL, 18/46 ON MRIDE, 75,000LB GALFAB HOIST, PIONEER RACK 'N PINION TARP, LOW MILES



CHASSIS PRICING AVAILABLE

\$59,500

2013 FREIGHTLINER CORONADO VAC TRUCK

CUMMINS ISX15 @ 525 HP, 18 SPEED, 20/46 ON HAULMAX, 4,700 GALLON CURRY TANK, MASPORT PUMP, 255/70R22.5 STEERABLE LIFT AXLE



BALANCE OF 5 YEAR FACTORY WARRANTY

STARTING @ \$189,500

2020 KENWORTH T880 ROLL OFF TRUCK

CUMMINS X15 @ 485 HP, ALLISON AUTOMATIC OR 8LL, 20/46 ON CHALMERS, 75,000LB GALFAB HOIST, PIONEER RACK 'N PINION TARP, LOW MILES



CHASSIS PRICING AVAILABLE

\$99,500

(2) 2015 INTERNATIONAL 5900iSBA VAC TRUCK

CUMMINS ISX15 @ 500 HP, 18 SPEED, 20/46 ON AIR RIDE, 110 BBL, 4,800 GALLON J&J TANK, FRUITLAND PUMP, 295/75R22.5 STEERABLE LIFT AXLE



BALANCE OF 5 YEAR FACTORY WARRANTY

\$199,500

2020 PETERBILT 567 TRI AXLE VAC TRUCK

CUMMINS X15 @ 485 HP, 18 SPEED, 20/46 ON AIR LEAF, CURRY TANK, 4,700 GALLON



CHASSIS PRICING AVAILABLE

\$109,500

2015 PETE 367 VAC TRUCK

CUMMINS ISX15 @ 550 HP, 18 SPEED, 20/46 ON HAULMAX, 4,700 GALLON CURRY TANK, NVE PUMP



BALANCE OF 5 YEAR FACTORY WARRANTY

\$209,500

2020 PETERBILT 567 QUAD AXLE VAC TRUCK

CUMMINS X15 @ 485 HP, 18 SPEED, 20/46 ON AIR LEAF, CURRY VAC TANK, 4,200 GALLON



CHASSIS PRICING AVAILABLE

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2014 MACK GU713 VAC TRUCK

MACK MP8 @ 455 HP, 8LL, 18/44 QUAD, J&J TANK, FRUITLAND PUMP



BALANCE OF 5 YEAR FACTORY WARRANTY

\$209,500

(2) 2020 PETERBILT 567 ROLL OFFS

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CUMMINS ISX15 @ 550 HP, 18 SPEED, 20/46 ON HAULMAX, 110 BBL TANK, MASPORT PUMP



CHASSIS PRICING AVAILABLE

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2016 PETERBILT 367 VAC TRUCK

CUMMINS X15 @ 550 HP, 18 SPEED, PETERBILT AIR TRAC, PIKRITE TANK, MASPORT PUMP



CHASSIS PRICING AVAILABLE

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MACK MP8 @ 505 HP, 13 SPEED, 20/46 ON CAMELBACK, J&J TANK, FRUITLAND PUMP



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(4) 2015 KENWORTH 367 VAC TRUCKS

PACCAR MX-13 @ 500 HP, 18 SPEED, 20/46 ON AIR RIDE, 110 BBL CROWN TANK, NATIONAL PUMP

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Ken Morton added a white 2019 Freightliner M2 with a 3,640-gallon stainless steel tank and National Vacuum Equipment 4310 blower from Advance Pump & Equipment. The truck is powered by a Cummins L9 350 hp engine with power reaching the wheels through a Fuller 8LL transmission (Eaton Vehicle Group). Features include three aluminum, double-door storage cabinets, a Garnet SeeLevel indicator, heated 4-inch front and rear intake and 6-inch dump valves, top and rear manways, rear LED work lights, and strobe beacon. The interior has air conditioning, Bluetooth stereo, leather bucket seats, air-ride, heated mirrors and power windows. Graphics are from Jason Lubben at Giddings Signs. The driver is Travis Hunter, and the truck is used for residential and light commercial pumping. ■

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Advanced Treatment Units

By Craig Mandli

AEROBIC TREATMENT

Knight Treatment Systems White Knight Microbial Inoculator Generator

The **White Knight Microbial Inoculator Generator** from **Knight Treatment Systems** offers an enhanced form of aerobic treatment that introduces, cultivates and releases selected microorganisms. It is designed to be simple to install in most septic tanks. It can be used to retrofit outdated aerobic treatment units and package treatment plants and enhance the performance of community and high-strength wastewater treatment systems and septage processing facilities. **800-560-2454; www.knighttreatment.com.**



SeptiTech STAAR

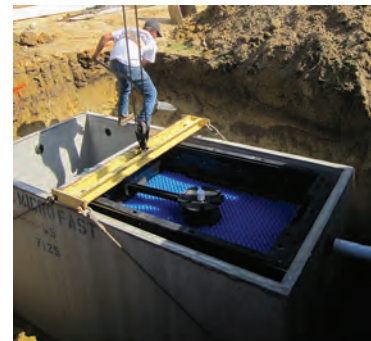
SeptiTech STAAR (Smart Trickling Anaerobic/Aerobic Recirculation) filter systems are designed for multifamily domestic and high-strength commercial wastewater systems with flows of 100 to more than 150,000 gpd. The systems use partially submerged media to treat high organic loads. The simple, automatic and reliable equalization and clarification process treats high-organic loads that integrate with other

technologies and accessories, according to the maker. The biological trickling filter technology also maintains low levels of Nitrate-N with all below-grade components that fit in readily available concrete, plastic or fiberglass tanks. Smart technology allows the system to go into a sleep mode that will dial down activity and eventually shut power off until normal flow conditions are detected. This reduces operating costs and power requirements. **207-333-6940; www.septitech.com.**

AERATION PUMPS/SYSTEMS

BioMicrobics MicroFAST

Available from 500- to more than 9,000-gpd applications, **MicroFAST** wastewater treatment systems or **MicroFITT-ee** (energy-efficient version) from **BioMicrobics** are advanced, integrated wastewater treatment systems with aeration and submerged fixed-film, suitable for residential and commercial applications. With the SFR feature of the FAST technology, alternate modes of operation include intermittent operation to reduce electricity usage up to 45% and extra denitrification from the already approximately 70% nitrogen reduction (NSF 245). Its biosolids treatment and sludge digestion enable cost-effective treatment with less maintenance. The effluent meets secondary quality requirements and can be distributed to a soil treatment system or water reuse applications. **913-422-0707; www.biomicrobics.com.**



(continued)

CASE STUDY

Installer performs emergency upgrades on adjacent lots

Problem: Neighboring residences on Three Mile Harbor in East Hampton, New York, had collapsing cesspools that needed to be replaced with a low-nitrogen treatment units pursuant to new government sanitary mandates. The project was complicated by the properties' tight footprint, close proximity to the harbor and a high water table.

Solution: Advanced Wastewater Solutions and A&A Sewer and Drain teamed up to replace the failing cesspools with **Fuji Clean USA CEN 5** onsite treatment units leading to pressurized shallow drainfields consisting of an Orenco Systems simplex pump station discharging into two rows of Infiltrator Water Technologies drainfield. The CEN units were designed to remove up to 80% of nitrogen from the wastewater effluent through contact filtration treatment. Wastewater is recirculated through aerobic and anaerobic chambers in direct contact with fixed-film media for biological digestion and mechanical filtration. The pressurized shallow drainfields further reduce total nitrogen and provide treatment of other contaminants by evenly distributing the effluent within 18 inches of the topsoil horizon, where increased microbial activity and nutrient absorption occur.

Result: Due to a special "emergency replacement" program adopted by Suffolk County, the installers were able to bypass the usual monthslong sanitary design and approval process and replace both of these failed cesspools with advanced systems in three days. **207-406-2927; www.fujicleanusa.com.**



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<p>1054 SERIES 42 HP 500 CFM @15" Hg 1000 RPM</p>	<p>1054LN SERIES 42 HP 500 CFM @15" Hg 1000 RPM</p>	<p>1604LN SERIES 82 HP 800 CFM @15" Hg 1000 RPM</p>	<p>2106LN SERIES 120 HP 1000 CFM @15" Hg 1000 RPM</p>	

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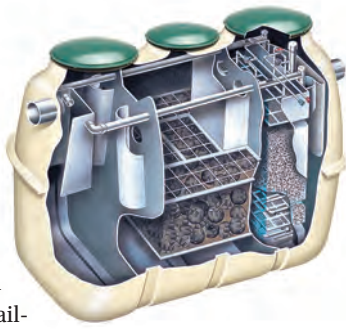
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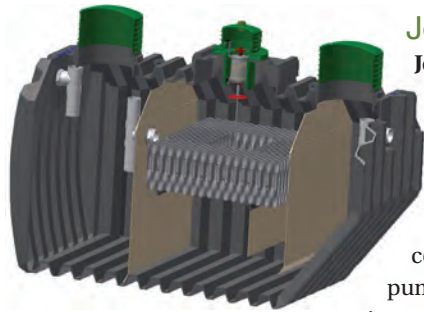
AERATION PUMPS/SYSTEMS

Clarus Environmental Fusion

Clarus Environmental's Fusion systems are drop-in wastewater treatment units designed for decentralized applications where effluent quality must meet or exceed secondary treatment standards. They are designed for residential, commercial and small community applications and are available in 450- to 4,000-gpd treatment capacities. All models up to 800 gpd are NSF/ANSI Standard 40 certified to produce effluent quality of 9 mg/L CBOD₅ and 9 mg/L TSS. The design enables installation without a pretreatment tank, making it suitable for sites with limited space. Effluent disposal options include conventional trenches, dosed systems, drip irrigation or disinfection with direct discharge. **800-928-7867; www.clarusenvironmental.com.**



Jet Inc. BAT Media Plants



Jet Inc. BAT Media Plants offer variable capacity in an NSF 40- and 245-listed treatment system. The precast concrete J-1500 Series provides complete effluent treatment from 500 to 1,500 gpd with the convenient option of a fully integrated pump tank. The 500- and 800-gpd PLT series tanks are the lightweight, rotational molded alternative to the concrete J-1500 Series. The seamless polyethylene tanks are easy to transport and install in the most difficult site conditions. **800-321-6960; www.jetincorp.com.**

NextGen Septic GenX Retrofit

GenX Retrofit septic technology from NextGen Septic can be installed in any approved septic tank and is designed to repair a clogged soil drainfield. It includes a compact, stand-alone, automated, two-stage treatment system for domestic sewage that produces a clean-water output. The sewage is collected in a tank, where solids break down under anoxic conditions, while the wastewater is aerated with biomedica and low-noise submersible pumps in the secondary compartment. The second stage occurs in a separate treatment unit, treating nitrogen and phosphorus through a no-maintenance membrane and ozone disinfection system. The process lets water and salt pass through, while rejecting the solids and dissolved organic contaminants to create an output suitable for surface discharge. According to the maker, the clogged field begins to percolate water in as little as eight to 12 weeks when the biomat is thin enough to allow water to get through at a reasonable rate. **513-673-3583; www.nextgenseptic.com.**



AERATION SYSTEMS

Geomatrix Systems SoilAir



SoilAir from Geomatrix Systems intermittently aerates the drain/leachfield and surrounding soils rather than constantly aerating wastewater in a tank. This process allows rapid rejuvenation of failed septic systems, extends the life span

of new leachfields and enhances treatment, according to the maker. Systems can serve single and multifamily homes, as well as challenging and high-strength waste streams, such as restaurants, hotels, marinas, laundromats, health care facilities, grocery stores, food processing facilities and convenience stores. **888-764-5247; www.soilair.com.**

CASE STUDY

Modules enable drainfield placement on undersized property

Problem: The owners of a three-bedroom home on Pelican Lake in Wisconsin utilized a holding tank and wanted to have a drainfield installed. The wooded property had limited space for a septic system due to multiple setbacks, including a well located at the side of the house, an S-curved driveway and the lake behind the house.

Solution: H&H Construction designed and installed a pump-to-gravity system that navigated through the wooded area. The installation included adding a 660-gallon pump chamber in series following the existing 1,000-gallon septic tank, with effluent pumped to the drainfield. A 77-by-6-foot trench was constructed to follow the setback from the curved driveway. The drainfield consists of a base of ASTM C33 sand and 14 Eljen GSF (Geotextile Sand Filter) B43 modules. The pipe on top of the GSF modules was connected using elbow fittings.

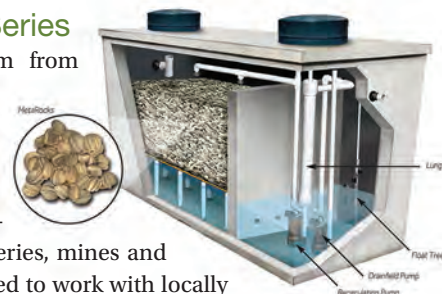


Result: The homeowners were able to stop costly pump-and-haul services by having a code-compliant drainfield. The Eljen GSF system ensures effluent is treated to secondary treatment standards before reaching the groundwater and lake. **800-444-1359; www.eljen.com.**

COMMERCIAL ONSITE TREATMENT SYSTEMS

Eliminite Commercial C-Series

The Commercial C-Series system from Eliminite is designed to provide reliable treatment with emphasis on total nitrogen reduction for high-strength waste applications such as work camps, RV parks, restaurants, ski and golf resorts, breweries, mines and agricultural operations. It is designed to work with locally sourced tanks and components when possible. MetaRocks treatment media is designed to withstand a variety of high-strength waste-loading scenarios, particularly where clogging and odor control are major considerations. The system is scalable and may be adapted to suit specific phasing requirements, site constraints and unique demands. **888-406-2289; www.eliminite.com.**



(continued)

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2012 Peterbilt 388

Long nose Cummins 525, 18 spd,
 4,700 gal., Masport liquid cool
 pump, Hendrickson suspension

\$60,000



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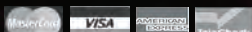
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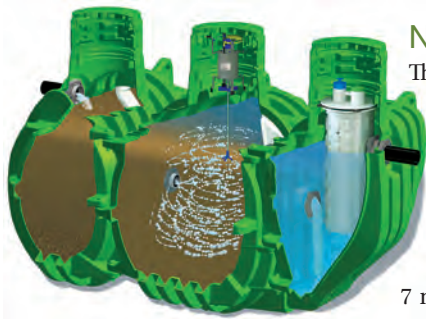
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NITROGEN REDUCTION SYSTEMS

Anua Puraflo Dn

The **Puraflo Dn** peat fiber biofilter system from **Anua** provides enhanced denitrification below 20 mg/L through recirculating 50% of the treated effluent back to the front end of the septic tank, according to the maker. Flow proportioning is accomplished through simple adaptations to external plumbing, allowing for a single-pump system with no aerators. In recirculation mode, each module is rated for domestic strength at 240-gpd total hydraulic loading equivalent and 120-gpd forward flow. It can be designed and installed as a combined treatment and effluent dispersal system. Treated effluent exits the modules via weep holes around the perimeter at the module base and flows into the dispersal system situated directly beneath the modules. Available dispersal system options are in-ground pad or mounded pad. **336-547-9338; www.anuainternational.com.**



Norweco Singlair TNT

The **Singlair TNT** (Total Nitrogen Treatment) system from **Norweco** is an advanced wastewater treatment system designed to reduce total nitrogen by more than 68%. Certified performance data from NSF Standard 245 verifies that average effluent contains 7 mg/L nitrate, 12 mg/L total nitrogen, 4 mg/L CBOD₅ and 9 mg/L TSS. The system of-

fers flow equalization, effluent filtration and low electrical usage. It is designed for easy installation, operation and maintenance to minimize effluent nitrogen concentrations, according to the maker. Nitrogen reduction is achieved without requiring effluent recirculation or the addition of chemicals. All treatment is accomplished within the tank. **800-667-9326; www.norweco.com.**

Scienco/FAST - a division of BioMicrobics BioBarrier Marine MBR

The **BioBarrier Marine MBR** from **Scienco/FAST - a division of BioMicrobics** uses the same design as the land-based BioBarrier membrane bioreactor and BioBarrier HSMBR (high-strength MBR) systems. The complete, optimized design of these MBRs simplifies the settling, screening, direct aeration and ultrafiltration of wastewater to remove 99.9% of contaminants, according to the maker. It is certified to NSF/ANSI 40 Class 1, NSF/ANSI 245 (nitrogen reduction), NSF/ANSI 350 (water reuse) and EN 12566-3 standards. The blackwater/graywater treatment system establishes the material, design, construction and performance requirements for onsite residential and commercial applications. Installed in watertight tanks, the systems also meet water-quality requirements for the reduction of chemical and microbiological contaminants for nonpotable water reuse. **913-422-0707; www.sciencofast.com.**



RECIRCULATING FILTERS

Delta Treatment Systems ECOPOD-N

The **ECOPOD-N** fixed-film bioreactor (FFBR) system from **Delta Treatment Systems** is a self-contained device that houses engineered PVC media designed to treat domestic wastewater. Five models accommodate daily flows of 500 to 1,500 gpd, with customizable options for commercial applications up to 100,000 gpd. It is suitable for individual residential installations, cluster designs and commercial wastewater treatment applications. It is certified to ANSI/NSF International Standards 40 and 245 and is Federal Housing Administration and Veterans Affairs acceptable. It can be inserted into a standard-size septic tank or vault to provide quiet, odorless operation, and it is suitable for intermittent usage with an average nitrogen reduction greater than 50%. It also minimizes sludge production, reducing pumpout frequency, according to the maker. **800-219-9183; www.deltatreatment.com.**



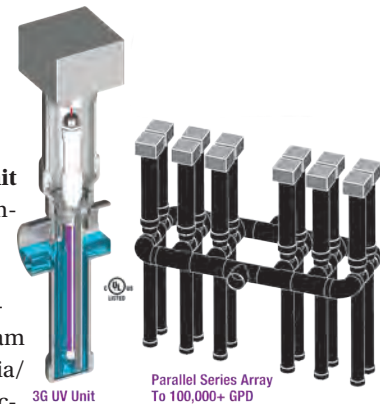
Ecoflo Biofilter

The **Ecoflo Biofilter** is an energy-free treatment that uses a renewable, compostable coconut husk filter, giving it a low carbon footprint. Most models come preassembled and ready to use. **800-632-6356; www.ecoflobiofilter.com.**

UV DISINFECTION EQUIPMENT

SALCOR 3G UV Wastewater Disinfection Unit

The **3G UV Wastewater Disinfection Unit** from **SALCOR** is used for residential, commercial and municipal applications, and it is UL-certified NEMA 6P flood-proof and NSF/Washington State Protocol six-month tested (with 21 upstream treatment systems). It inactivates bacteria/virus pathogens, including superbugs, according to the maker. Rated at 9,000-gpd gravity flow, it is meant as a reliable building block for large water recovery/reuse systems. When installed in 12-unit parallel/series arrays with ABS pipe fittings, systems can disinfect more than 100,000 gpd. Gravity flow equalizes without distribution boxes. Each unit has a foul-resistant Teflon lamp covering, two-year long-life lamp with efficient installation, minimal annual maintenance and energy use of less than 40 watts. **760-731-0745; www.salcor.world. ■**





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BUSINESSES



FOR SALE: Since 1951, TA Lauritsen Septic & Drain – located in south-central Minnesota – has been a great business. Owner wishes to retire. 2 beautiful Kenworths with 3,500-gallon stainless-steel tanks & hoists. Many roto rooters, jetters and locators. Also 3-stall heated shop and an additional 40' x 80' new building. No septic competition in the area. Call Tom for more information. Check out talauritsen-septic.com for photos.

320-269-2920

P04

Portable toilet business for sale in Charlotte, Winston-Salem, Greensboro NC and surrounding area. 350+ portable toilets, holding tanks, half toilets, handwashing stations. Serious inquires only. Call 336-345-4392. (P03)

Portable restroom service business for sale located in Bluffton, Ohio. Approximately 160 portable restrooms, 8 handicap units, 12 handwash stations, 2006 FM Mfg. 10-unit trailer with hand cart, 2006 Ford F750 service truck with 1,500/300 gallon tank. Serious inquiries to Mrseptic6@gmail.com or basi1@comcast.net. (P03)

www.RooterMan.com. Franchises available with low flat fee. New concept. Visit website or call **1-800-700-8062**. (PBM)

Dominant Septic Services Company in beautiful Oregon. Owner retiring. Construction, repairs, servicing. Over \$500K in pumper trucks, fully-stocked trucks, mini-excavator, multiple-size cable machines, hydro-jetters. \$179,756 cash flow, excellent staff. Keeping two outside plumbers busy (additional in-house income.) Buy the business for \$670,830 and lease the building, or add building for \$310,000. SBA loan proposal. Gary.Richards@PNBrokers.com. (P03)

Hudson Valley, NY: Looking to retire from 58 years in the septic business. This area has over 500,000 septic in a 50-mile radius & is growing rapidly. We have thousands of faithful customers from pumpings, repairs, installs & inspections along with a residual business of maintenance contracts that brings in \$53 - \$63/month each with a lifetime guarantee on leach repair. \$793k. Visit my website: americanseptic.com, then call John 845-674-3022. (P03)

Cooking oil processing plant. Includes 3 tanks and low-pressure boiler. 2,000-gallon screened tank, 6,000-gallon cook tank with heating coils, 7,500-gallon finished product tank. \$7,500. 443-235-5979 (P03)

Business for sale. Located in the Piedmont of South Carolina. 60 mile proximity of Charlotte, NC, Columbia, SC & Spartanburg, SC. (2) 2016 service trucks, (1) 2014 pickup and delivery truck, (2) 3-station total climate control portable restroom trailers, 300 construction units, 36 special event units - used for special events only. Year round work handwash stations, black-water holding tanks, freshwater holding tanks. 30 years in business, established customer base, repeat customers. Owner retiring. 803-385-8681. \$325,000. (P05)

Very diversified Environmental Services Company for sale. Owner is retiring. Septic and grease trap cleaning, drain cleaning, portable restrooms, video camera services, lift station services, trenchless pipe joint repair, confined space services, hydroexcavation, tank cleaning, excavation, frac tanks, distributor for several home aeration systems, authorized service center for E-One pumps. Residential, commercial, industrial, municipal services. Located in Northwest Ohio for over 40 years. Very profitable. Late model equipment in good condition. Turnkey operation. Business is run remotely. Serious inquiries to MrSeptic6@gmail.com or basi1@comcast.net. (P03)

Own the Alaskan Dream near New Ski area! Two septic trucks, tractor with tanker, phone numbers, name, and customer list - \$295,000. Add shop, new home, and two rentals for a total of \$895,000. 907-841-8632 or akpacer@yahoo.com. (P03)

COMPUTER SOFTWARE

FreeServiceReminderSoftware.com, FreeServiceDispatchSoftware.com, FreeRouteManagementSoftware.com. (PBM)

DEWATERING



Flo Trend Sludge Mate 12-cubic-yard gooseneck trailer-mounted dewatering box. Built in 2002, refurbished in 2017.

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P03

DRAINFIELD RESTORATION



2000 Terralift for sale. Comes with all new hydraulic hoses, all new hydraulic filter and hydraulic oil, new plugs, oil and filter, probe and beads. This machine is ready to make \$\$.....\$16,500 OBO

203-948-4258, CT

ayorkrooter@gmail.com

P03

EXCAVATING

2004 JCB backhoe, 4WD, Extend-A-Hoe, heated cab w/glass, no a/c, AM/FM stereo. 2 ft. wide bucket. Everything works except hour meter. \$15,000. 410-795-2947 (P03)

HAZARDOUS WASTE UNITS

2020 Peterbilt w/Presvac Powervac, stainless steel, DOT-certified. 5,500cfm Hibon 27" wet/dry blower, dump/door vacuum truck with boom and Presvac PV750 offloading pump. Cummins ISX 500hp with Fuller transmission. 46k air rears with 13k pusher and 20k front. KLM Companies 617-909-9044 (PBM)

1997 Ford with Cusco 3,200-gallon DOT certified dump and door liquid vacuum truck. Cat engine with Moro M9 vacuum pump. Runs and pumps excellent. \$37,500. KLM Companies 617-909-9044 (PBM)

Stainless steel DOT Code hazardous waste or septic. Polar 3,600-gallon tank ready to mount on your chassis or sell outright. 20" rear manway, two 4" inch rear valves with full stainless hose trays. KLM Companies 617-909-9044 (PBM)

2020 Peterbilt 348 cab & chassis with PX9, automatic transmission, 350hp. Presvac 3,200 U.S. gallon, carbon steel, full-open rear door, dump-type unit with Presvac PV750 vacuum pump. (Stock# 13842) www.VacuumSalesInc.com (888) **VAC-UNIT (822-8648)** (PBM)

1984 Mack R686ST with a 1999 Keith Huber Dominator 3,000-gallon carbon-steel, dump type, DOT, vacuum tank unit. (Stock# 1165C) www.VacuumSalesInc.com (888) **VAC-UNIT (822-8648)** (PBM)

JET VACS



2007 Sterling L8500 vacuum truck. 6-speed, Allison automatic. Re-circulation pkg., hydroexcavation pkg. \$54,995

Todd 319-521-8175, IA

P03



2003 Sterling 7501 Vac-Con 390, 130,000 miles, Cat 3126 275hp, 80gpm jet. New hydroexcavating kit & recirculation, new boom (8" hose). Cummins aux. engine. 40' aluminum pipe, washdown gun, jet nozzles. 1,000-gallon freshwater, 1,000-gallon waste tank. ... \$70,000

Seth 330-231-5943, OH

P04

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Frank 978-758-6265, MA PBM



1999 Ford F450, 7.3 turbo diesel, automatic, a/c. 132,179 miles. Has a Yamar diesel engine that runs the jetter with swivel mount in the rear. Venture crane. \$17,500 OBO

813-917-8898, FL P03

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PORTABLE RESTROOM TRAILERS

2013 Ameri-Can Engineering 612 Royale Dooley. Pewter in color. 2 stalls, one women/baby changing station, one men. \$17,500. Please reach out to Kimberli at PortaPros for more information and images 208-467-0089 or kimi@portapros.com. (P08)

2001 Keith Huber International pump truck. 2 Decons, 28' Tonto, 18' Royal, 2001 ASCI, 16' Presidential, 26' Presidential, portable toilet hauler trailers. 315-437-1291, NY. (PBM)

PORTABLE RESTROOM TRUCKS



2014 Dodge 3500, Hemi gas engine, auto, 70,000 miles, 2WD. New aluminum 450-gallon vac tank, 300 waste/250 water, Masport vac pump, Honda engine.

Call JR @ 720-253-8014, CO PBM



2015 Dodge 5500, 199,000 miles, 900/300, dual side onboard pressure washer. Solid truck. Asking \$38,000

814-277-6227, PA P05



Texla Services Portable Toilet Service Truck Bodies – Standard turnkey package mounted on your chassis includes: painted body, lighting, right angle Jurap, DC10, water hose, valves & plumbing and PTO. 1,100/400 - \$22,500; 700/300 - \$19,500; 1,700/600 - \$24,500.

936-641-3938

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Used **2016 International 4300**. 1,800-gallon tank - 1,400 waste/400 water. Truck is located in Goliad, Texas. \$40,000 or best cash offer. Call and ask for Matt or please leave a message. You can also email for more information.

361-649-2105, TX P03
agsservicesLLC2019@gmail.com



2019 Ford F750 with only 5,250 miles! 1,800-gallon waste/300-gallon fresh. Dual side service with Masport HXL75 pump. DC10 water pump. 50 ft. hose with Hannay spring-rewind reel. Basically **BRAND NEW!**Asking \$95,000

815-499-2891, IL P03



White House Sanitation in the Southern California area has an **1999 International 4700** with a DT466 engine for sale. 1,000/250 split tank. Tuthill Rotary Blower 4005, DC10 washdown pump. Automatic transmission with hydraulic brakes. \$7,500. Also available: 2000 International 4700 with DT466 engine. Auto transmission with air brakes. Good tank, not currently running.

Ryan Blackburn 951-834-3790
ryanwhs@gmail.com P03



2015 Dodge 5500, 125,000 miles, 450-gallon waste/250-gallon fresh. Asking \$40,000. Call Brix for more details:

815-946-2813, IL P03

Portable toilet truck for sale. Built by Satellite Industries. Tank is 500-gallon waste and 300-gallon freshwater. Heads have been replaced by Ford dealer (\$10,000). Just installed new Conde Pump (\$1,600). Also has a new freshwater pump. Many other repairs performed. Truck is ready to work! Call 260-432-5132. (P03)

2006 Ford F750 vac truck with Cummins motor and Masport pump. \$22,500 OBO. Contact us at 419-358-1936 or basi_mm@yahoo.com for more information. (P03)

2006 GMC cabover diesel portable toilet service truck. Automatic transmission. Aluminum tank, 750 waste, 300 fresh. Dual tool box, dual service. 200,000 miles. Everything works, frame rusty, \$5,000. Call or text Bob 609-868-6716. NJ (P03)



2020 Hino 268A, 1,500 waste/500 fresh, portable septic with flipdown dual toilet carrier. Big Masport 3" viper pump pack, AMT stainless washdown pump, hose reel, 2" hose and service wand, dual storage boxes, LED rear and side lighting, 4" side discharge, 10k FA, 16k RA. \$107,300

918-607-1006 P03

2014 Imperial 1,175-gallon aluminum portable toilet service unit, 775 waste – 400 water with Masport HXL4 pump (no truck). (Stock# 71975V). **www.vacuumsalesinc.com (888) VAC-UNIT (822-8648)** (PBM)

2000 International 4700 cab & chassis with a 500 waste/300 freshwater compartment with a Masport HXL4V vacuum pump. (Stock# 0767C) **www.VacuumSalesInc.com (888) VAC-UNIT (822-8648)** (PBM)

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RENTAL EQUIPMENT

Liquid vacs, wet/dry industrial vacs, combination jetter/vacs, vacuum street sweeper & catch basin cleaner, truck & trailer mounted jettors. All available for daily, weekly, monthly, and yearly rentals. **VSI Rentals, LLC, (888) VAC-UNIT (822-8648)** **www.vsi rentalsllc.com** (PBM)

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2019 Acro Vacuum Trailer: Stainless steel 6,000 gallon, DOT certified double conical with air-ride suspension. Aluminum wheels all positions, full hose trays, OSHA walkways and railings. Vacuum pump option either hydraulic or self-contained. KLM Rentals, Inc. 617-909-9044 (PBM)

ROLL-OFF TRAILERS

2001 ESP Roll-off trailer: Two (2) container roll-off trailer good brakes, tires, frame. etc. KLM Companies 617-909-9044 (PBM)

SEPTIC TANK FORMS

Septic tank forms, boom trucks, complete 8-yard batch plant & mixer, along with associated equipment. Cookeville, TN. For equipment list & pricing, call 931-526-2964 or email precast@frontier.com (P03)

SEPTIC TRUCKS



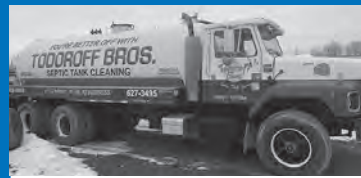
2013 Kenworth T440, 4,200-gallon aluminum Progress tank, Challenger vacuum pump, Garnet gauge, jetter. New transmission and rebuilt engine 01/23/2020 by Kenworth with 1-year/100,000-mile warranty. \$115,500
Abracadabra Septic Pumping LP
832-777-7540, TX P04



2007 Sterling LT9513, 405,833 miles. Mercedes Benz 4000 - 410hp. Eaton-Fuller 8LL transmission. 2008 Progress 4,800-gallon aluminum tank. NVE 866 vacuum pump. Water jetter. Heated valves. \$50,000
508-697-9974, MA
bobbrenton@wvsiofma.com P03



2010 International, 198,000 miles, 8LL, 3,500-gallon steel tank, Masport pump package.
866-720-4999 PBM



1995 International, DT466 engine, 277,883 miles, 4,000-gallon tank, TSI 500 pump. Tank and pump updated in 2008. \$24,000
Steve 248-343-3010, MI P04



2010 Peterbilt 348, only 105,750 miles, 8LL trans, Paccar Cummins PX 8 motor, 2010 3,600-gallon Presvac vac tank with Masport HXL 400 vac pump. Good rubber, one owner. Truck is ready to go to work. \$70,000 OBO
570-806-1482, PA P03



2014 Hino 338 septic pump truck. This truck is solid! Hino inline-6 diesel engine, 260hp. Allison manual transmission. 2,500-gallon capacity aluminum tank. Gross vehicle weight 26,000 lbs. Masport HXL15v PTO vac pump, vacuum/pressure 350cfm. General 3,000psi PTO jetter with 200 ft. 3/8" pressure hose and 50-gallon freshwater tank. 196k miles. \$43,900. Also have a 2015 Hino 338 w/171k miles, same specs. \$49,900. Call Billy for additional pictures and further details.
770-365-2566, GA P03



2014 Peterbilt 337, under CDL, 260hp, automatic. New 2,000-gallon carbon-steel tank, new Masport Viper, 350cfm, new tires and aluminum rims, automatic PTO. \$67,000
Alan 786-908-5436 P03



2018 Hino 338, 45,000 miles, automatic, 220hp. New 2,500-gallon carbon-steel tank, new Masport Viper pump 350cfm, new tires and aluminum rims. \$69,000
Alan 786-908-5436 P03



2020 Kenworth T370, PX-9 (300hp) engine, Allison automatic transmission, FA 12k, RA 21k, trailer hookups, 2,500-gallon steel vac tank, Jurup XR-260 vacuum pump, (2) 4" suction ports, 36" rear hatch, 36" toolbox. \$115,900
918-607-1006 P03



2018 Peterbilt 348, ISX Cummins, 50k miles. 4" NVE LC pump, 3,600-gallon tank. \$129,000. Other trucks available.
Call 318-207-2749, LA P03



2007 International, DT466, 246k miles, 10-speed transmission, heavy axles, exhaust brake. A/C, cruise. New 3,600-gallon tank, stainless hose trays, aluminum on sides, Fruitland 500 vac pump. New: paint, tires and aluminum wheels. Very nice truck. \$55,000. Financing and delivery options available.
Hull's Truck Bodies, LLC
740-820-5338, OH P03

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2013 International 4300, under CDL. DT466 diesel, auto., 130k miles. NEW 1,800-gallon steel vacuum tank with Masport pump.

Call JR @ 720-253-8014, CO PBM



2020 Hino 338, 260hp engine, Allison automatic transmission, trailer hook-ups, 2,500-gallon steel vac tank, Juroop 260 vac pump, 36" rear hatch, (2) 4" suction parts, 36" toolbox. 12k front axle, 21k rear axle. \$108,500

918-607-1006 P03



Texla Services Vacuum Truck Bodies – Turnkey package mounted on your chassis includes: painted body, lighting, valves, PTO and pump. 3,600-gallon - \$25,000; 2,500-gallon - \$22,000; 1,500-gallon - \$18,500. Many custom options are available. Bodies out of paint: 2,500-gallon - \$13,500. Self-contained skids available.

936-641-3938

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2012 International WorkStar, Maxx-Force 13 430hp, 8LL air-ride, full locking rears, 256k miles. 3,500-gallon two-compartment stainless steel tank (3,300 waste/200 fresh). Has washdown pump, heated valves and a load-level indicator. NVE 866 Challenger air-cooled pump. Spare pump to go with the truck also. Asking \$70,000

Call 740-391-5514, OH P03



2007 Kenworth T800 w/Cat 335, 10-speed transmission, 3,500-gallon Imperial tank w/Wittig RFL100, 430cfm, heated discharge collars, 387,906 miles. Current inspection, ready to work. \$49,000

800-433-2070, PA
associatedprod@aol.com P03



2020 Kenworth T370, 3,600-gallon 1/4" powder-coated steel vacuum tank, Juroop LC420 pump, hose trays, 36" rear hatch, heavy-duty bumper, (2) 4" suction ports, trailer hookups, (2) 36" toolbox. 350hp Cummins, Allison auto transmission, chrome bumper, aluminum wheels. \$132,866

918-607-1006 P03



2015 Peterbilt 337, IN STOCK, 300hp, automatic, 2,200-gallon aluminum tank, HXL400 pump.

866-720-4999 PBM



1997 Peterbilt 379, C-12 engine, 240k miles, 3,600-gallon PikRite vacuum tank, 750 Presvac vacuum pump. Works daily. \$50,000 OBO

Call 484-764-6351, PA P04



2013 Freightliner Cascadia, new 3,500-gallon vacuum tank, new Juroop R260 pump, new power takeoff, new Detroit DD15 450hp motor. New transmission, 10-speed, 355 rear lockers, suspension, cold a/c, 90% rubber on tires, disc brakes. 513,000 miles. Red and black, excellent find with all the new parts and accessories. \$60,000

800-721-2774 PBM



2020 Hino 268A, 260hp engine, Allison automatic transmission, 1,900-gallon steel vac tank, 12-gallon cyclone sec, HotShift PTO, (2) 4" suction ports, 36" toolbox, non-CDL, 10k FA, 16k RA, trailer hookups. \$95,500

918-607-1006 P03



1998 Freightliner vacuum truck w/ Cummins M11 engine. 2005 Amthor 4,000-gallon aluminum tank. Masport H400W pump. As is/work ready, bought out a competitor and do not need the truck. Wanting to sell quickly. \$42,000 OBO (As always, cheaper with cash).

Text 330-442-8070, OH P03
info@kingsanitaryservice.com



2014 Freightliner M2 with 179,000 miles on a Cummins. Under CDL. Fresh DOT inspection. New 2,100-gallon aluminum tank, new pump, new PTO, turnkey and ready to work. Shipping and financing available!

Call Isaiah @ 501-284-5505,
Logan @ 832-928-0985,
or Caleb @ 281-914-1192, AR P03



2020 Kenworth T270, PX-7 (300hp) engine, Allison automatic transmission, 1,900-gallon steel vac tank, 12-gallon cyclone sec, HotShift PTO, (2) 4" suction ports, 36" toolbox, non-CDL, 10k FA, 16k RA, trailer hookups. \$99,975

918-607-1006 P03



Ford L8000. 150,000 miles on newer motor installed not long ago. Under CDL. Hydraulic brakes. Daily user. 2,000-gallon-ish tank. Solid Battioni pump. Starts and runs great. Fresh oil change. Ready to work. Will make a greater starter or backup truck. Shipping available.

Call Isaiah @ 501-284-5505,
Logan @ 832-928-0985,
or Caleb @ 281-914-1192, AR P03



2006 Freightliner septic truck, C13, 425ghp, 10-speed. New build April 2018. Split tank 2,100/200, bucket fill and hose reel. Call or text for more information and pictures. \$46,000 OBO. Will consider all offers.

406-679-5200 P03



1997 International, 330hp, Cummins engine, 8LL transmission, 134k miles. A/C & cruise, newer 3,500-gallon tank and Masport 400 vac pump. Truck runs and drives great. \$22,000. Financing and delivery options available.

Hull's Truck Bodies, LLC
740-820-5338, OH P03

SEPTIC TRUCKS



2006 Peterbilt 335. 168,000 miles on a pre-emission Cummins ISC. Allison automatic transmission. New 2,500-gallon aluminum tank, new NVE 607 vacuum pump, new PTO. We ship.

**Call Isaiah @ 501-284-5505,
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2007 International 8600. 154,000 miles on a pre-emission Cummins ISM. Engine brakes. New 2,500-gallon aluminum tank, New vacuum pump, new PTO. Shipping and financing.

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2017 International, 6.7 Cummins, 74k miles, automatic transmission, under CDL. A/C, cruise, new aluminum tank 900/400, Jurop PN58 vac pump, and 94gpm washdown pump. This truck has all new equipment. Excellent condition. \$62,000. Financing and delivery options available.

**Hull's Truck Bodies, LLC
740-820-5338, OH** P03

1990 Freightliner septic truck. 628,209 miles. Current on all maintenance. Registration is valid. Asking \$19,500. For more information, call 707-839-2270. (P03)

2002 Mack RD688, 4,600-gallon steel tank with NVE 886 Challenger pump. 8-speed with lo-lol Eaton transmission. Double frame, rear tool boxes, lock-in diff., new rear tires and lift axle bags. 378,000 miles. \$46,000 OBO. Call Dustin 570-772-4255. (P03)



1999 International 4,500-gallon vacuum truck equipped with a 415 Masport vacuum pump. Heated mirrors, Johnson Mathews emission-reduction system, Caterpillar 3406 engine. Asking \$30,000 OBO

**Call Guadalupe Valencia
408-799-7993, CA** P04



Low-mile vacuum/pump trucks for sale. All shapes and sizes. Multiples of each one. Pre-emission, post-emission, single axle, tandem, auto. trans., manual trans., steel and aluminum. Tanks, pumps, parts, flat beds, boxes, slide-in units, and chassis' for sale as well! Shipping, financing, trade-ins. Central Arkansas.

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or Caleb @ 281-914-1192** P03



2000 Freightliner pump truck. Strong Cummins 330 ISM engine, 829,654 miles. Super 10 transmission rebuilt approximately 5 years ago. 3,600-gallon tank newly sandblasted and painted. Masport pump. Good tires. Runs everyday!! Strong truck. \$36,000 OBO

772-777-5494, FL P03

2008 Peterbilt 335 Series. 178,000 miles, 6-speed, Masport HXL 15 pump, 888 engine hours. 2,800-gallon aluminum tank. Tank has small hole in bottom. Truck runs and pumps good. Perfect if already have tank. \$25,000. 706-798-8023 (P03)

1984 IHC DT466, 1991 Jays 2,600-gallon tank, MEC 8000 pump, 3 tool boxes, 4" front & rear valves, 6" air dump, air operated top hatch, fresh water tank, 80% rubber. Stored in heated shop. Can text pictures. \$9,500 OBO. Call 715-206-4000. (P04)



2014 Peterbilt 348 tanker, 3,600-gallon tank, Masport liquid-cooled pumps, heated valves, tires 80%. 350 Cummins engine, Allison 6-speed transmission, AirTrac air suspension. 215,000 miles. \$85,000 OBO

**989-387-0825, MI
lilwillies@live.com** P03



2003 International 4300 septic pumper. 203,854 miles. 2,300-gallon tank, 4" valves and hoses. Fruitland pump. Well maintained. 6-wheel. Needs some minor body work (paint). Truck is located in St. Michaels, MD. ... \$25,000

**Contact Tyler Septic Services
410-745-2323
tylerconco@aol.com** P03



2011 Mack CX613, 389,000 miles, MP7 Mack engine, 10-speed. New 4,000-gallon steel tank, new Jurop pump LC420, 420cfm. Brand-new tires all around, polished aluminum rims, 20K front, 40k rear. \$79,900

Call Alan 786-908-5436 P03

2003 Sterling 9500 septic truck for sale. 4,800-gallon Imperial steel tank. Masport liquid-cooled pump with new vanes in fall. (2) 4-inch heated inlets on rear, 6-inch heated dump valve. (1) 3-inch inlet on front passenger side. 50-gallon freshwater tank. 2 aluminum tool boxes. All aluminum wheels. New steer tires. Drives put on over summer. Newer steerable tag. All springs, pins and bushings new in last 18 months. New brakes on drives. Dash completely rebuilt by IState last year. C-13 CAT 450hp with 436,000 miles, 8LL trans. \$62,500. Call 715-282-3553. Ask for Tom or Greg. (P03)



2012 Peterbilt 367, Cummins ISX 525, 18-speed, 520,810 miles, fresh engine rebuild. Jake, 4,650-gallon vacuum tank, Fruitland vacuum pump, 20,000lb fronts / 46,000lb rears, third axle, aluminum wheels. Heated valves, level indicator. Very nice truck, Vin 1893/unit 330

**Phoenix Truck Center
404-844-8968** P03

2003 Mack Granite, 5,000-gallon, 400 Mack, Allison auto, NVE blower vacuum pump, lift axle, 4" front valve, 6" discharge, large tool box, 379,000 miles. Engine recently completely rebuilt. Antifreeze in oil, starts right up, everything works. \$30,000. Call or text Bob 609-868-6716. NJ (P03)

1994 Volvo WG64 with Presvac 3,300-gallon tank. Cat 3406, 400hp with Fruitland 1200 vacuum pump. \$25,500. KLM Companies 617-909-9044 (PBM)

2001 International 4700 cab & chassis with a Transway 2,400 U.S. gallon, carbon steel, dump-type vacuum tank with a Fruitland RDF500 vacuum pump. (Stock# 7295C) **www.VacuumSalesInc.com (888) VAC-UNIT (822-8648)** (PBM)

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1983 Mack R686ST cab & chassis with a Presvac 3,200 U.S. gallon, carbon-steel vacuum tank with Masport H15WV vacuum pump. (Stock# 8463C) **www.VacuumSalesInc.com (888) VAC-UNIT (822-8648)** (PBM)

1999 Sterling L9000 tri-axle cab & chassis with a 4,000 U.S. gallon Keith Huber Dominator, two compartment (500 water - 3,500 waste) C/S. Full-opening rear door, dump-type unit with a Becker 440 vacuum pump and jetting system. (Stock# 3408C) **www.VacuumSalesInc.com (888) VAC-UNIT (822-8648)** (PBM)

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1999 3,800-gallon vacuum tank on single-axle trailer. Fruitland pump. Option to separate and purchase tank only. Tank & pump - \$3,800. Call 978-265-7943. (P03)



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TRUCKS - MISC.



1994 Kenworth T800 w/Detroit Series 60, 10-speed transmission, 3,500-gallon tank, 500??k miles, 5,800 hours. We just bought business and the truck was part of package – we do not need an additional truck. Current inspection, ready to work for \$28,500. Any questions - feel free to ask.

Call Joe 315-365-2853 x201, NY or email info@averdi.com P03



1998 International, 5,351 original blower hours. \$85,000.

James Rooney 713-304-4148, TX mickey@cleancosystems.com P04



2011 Kenworth T-800, Cummins ISX 485, 18-speed, Transway-built 4000-gallon waste, 200-gallon freshwater w/high pressure jet. Full hoist and rear-open door. Transway 1200 pump. 167,500 miles, 14,500 hours.... Asking \$120,000

802-658-6243, VT P03

1996 Western Star 4964F. 3406E CAT. 13-speed. 3,200-gallon steel tank manufactured by So Cal Tank & Fabrication, Perris, CA in 2008. 200 hrs. on rebuilt Masport W400 with auto shift. 120 ft. of 3" Kanaflex suction hoses 8'- 4" discharge hose. I'm the 2nd owner that had the truck built. Good, reliable, ready-to-work truck that runs strong. No smoke, transmission is solid. Worked this truck up until the day my new one was online. \$19,500. 951-780-2255. Riverside, CA. (P03)



2006 International, 184,902 miles, PD blower, 7,802 blower hours, 20 ft. trenches. \$135,000

James Rooney 713-304-4148, TX mickey@cleancosystems.com P04



1988 GMC C7D064 tandem, 10.4L V8 diesel. TopKick 7000. Used sludge truck with 118,500 miles. Serviced regularly. Runs as it should. Text for more photos or information. \$30,000 OBO

803-319-8760, SC P03

TV INSPECTION

2010 Freightliner Sprinter 3500 diesel sewer inspection truck w/ 192,000 miles. New DPF exhaust system August 2017 @ 130,000 miles. Brand-new Onan diesel generator November 2017. Camera equipment is an IBAK Lisy 150 Lateral Launch on a KRA-75 IBAK tractor. Technician station, all computers, and copper coax cable included. \$35,000 OBO. 231-631-4101 (P03)

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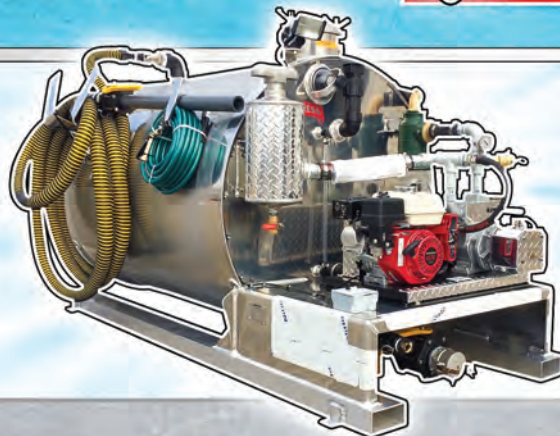
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